

# MARINE REVIEW.

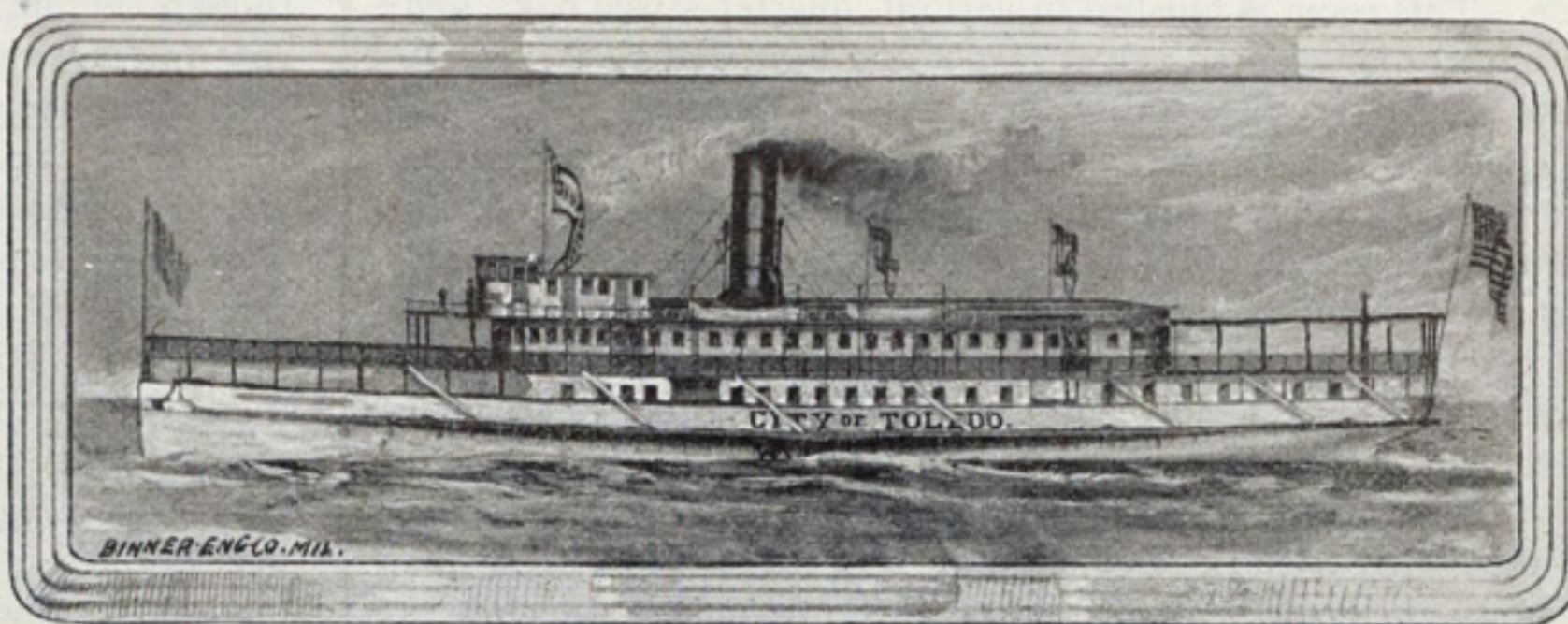
VOL. V.

CLEVELAND, OHIO, THURSDAY, JUNE 23, 1892.

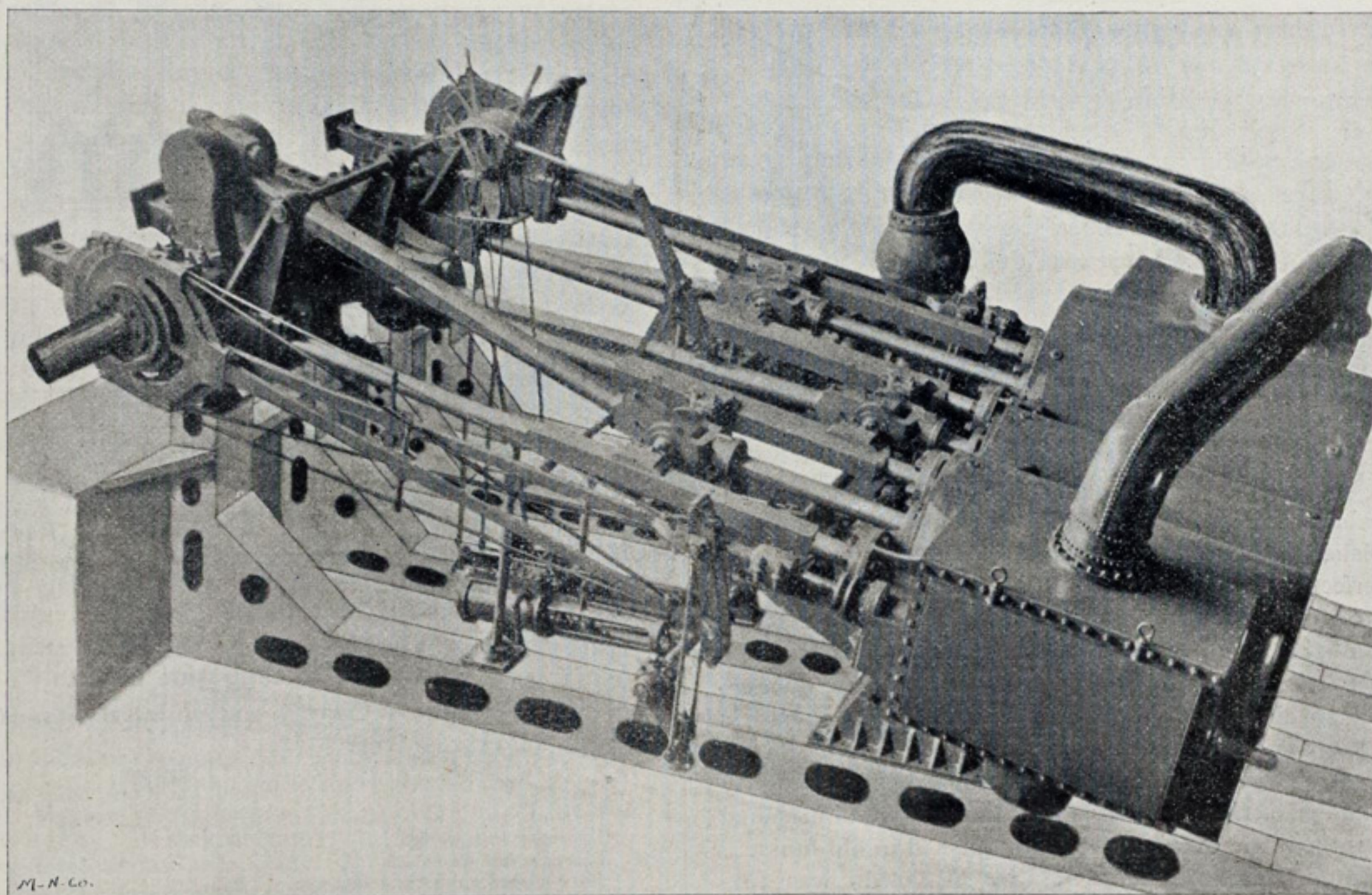
No. 26.

## Excursion Steamer City of Toledo.

In the construction of the side-wheel steamer City of Toledo, now engaged in passenger business between Toledo and Lake Erie islands, the lakes present another type of boat that will prove especially interesting to builders and owners in the excursion business. Engravings of the boat and her machinery, as well as the yard of the Craig Ship Building Company, Toledo, where she was built, accompany this issue. The boat is owned by the Toledo and Island Steamboat Company of Toledo and is distinctively an excursion steamer. The machinery, built by the Cleveland Ship Building Company, is a leading feature in the boat. The engines are believed to be the first inclined triple expansion three crank engines ever built and great credit is due to designers and builders for turning out so good a job of an entirely new type, as it is thought they will be the coming engines for high speed, economical side-wheel steamers.



at highest speed. This was accomplished by a judicious combination of partial horizontal and vertical bulkheads. Two boilers of the gunboat type furnish steam at 160 pounds working pressure. The boilers are 10 feet 10 inches diameter by 21 feet long, each one having three 46-inch furnaces. On trial these engines have developed 1,641 indicated horse power running at 40 revolutions per minute. Mr. A. Angstrum of the



INCLINED TRIPLE EXPANSION ENGINES OF STEAMER CITY OF TOLEDO.

The cylinders are 26, 42 and 66 inches by 72 inches stroke. The high pressure cylinder is placed between the intermediate and low pressure cylinders and has a piston valve actuated by a Joy radial valve gear. The intermediate and low pressure cylinders have double-ported slide valves and ordinary link motion. The air pump is operated independent of the main engine and is of the duplex type. The wheels are of the feathering type, 19½ feet outside of floats, which are 9½ feet wide, there being nine to each wheel. The manner devised by the engine builders for supporting the engine in the hull is noteworthy from the fact that there is a total absence of vibration even when running

Cleveland Ship Building Company was the designer of the engines

The City of Toledo was built to accommodate the travel between Toledo and Put-in-Bay, and is probably as great a success as an excursion steamer as anything ever built on the lakes. She is 210 feet on line of floatation, 32 feet beam and 12½ feet moulded depth. She is built of mild steel and was guaranteed by her contractors to make 16 statute miles without any extra exertion in the way of making steam. She has exceeded that, having made the 16-mile run from West Sister light-house to Middle Bass club house dock in 47 minutes, over 20 miles an hour. The boilers and machinery are all below the main deck,

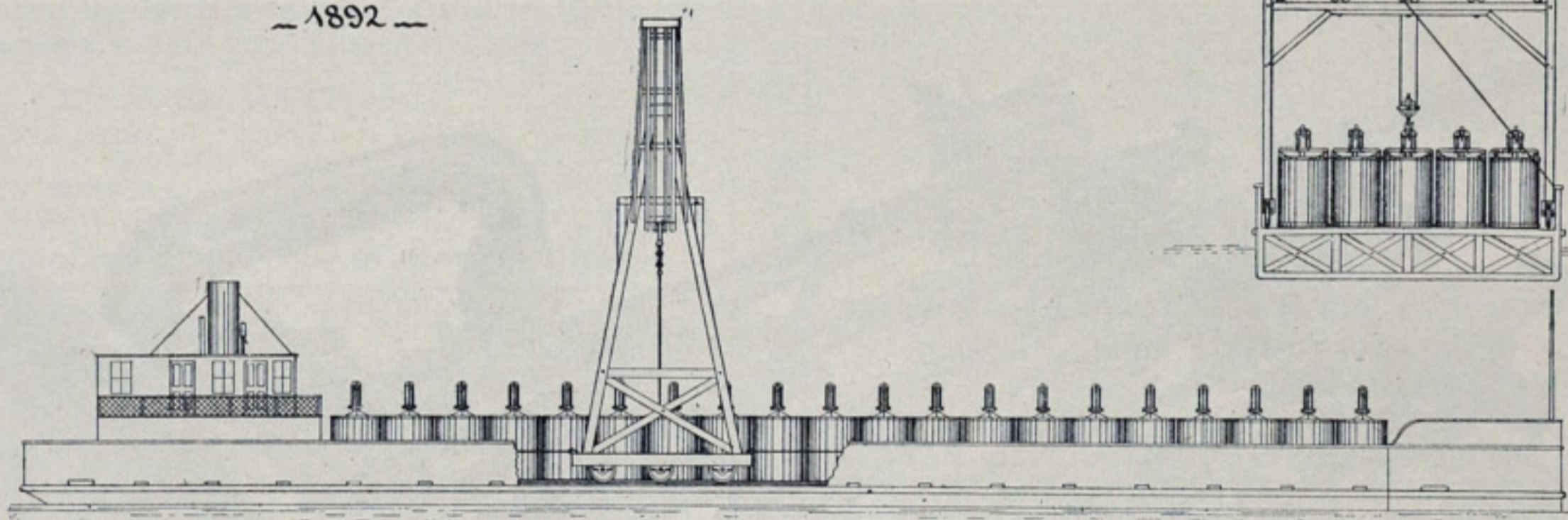
giving her a large hall on that deck. The dining room is also on the main deck, which makes it light and airy, and altogether an improvement over the dark, cramped dining rooms usually found in the hold. A large stairway, 12 feet wide, connects the social hall with the saloon on the promenade deck, which is 75 feet long and 30 feet wide, with one tier of staterooms on each side. This room is finished in natural quarter-sawn oak, and with a maroon colored velvet carpet and light ceiling makes the whole effect very pleasant to the lover of harmony in colors. The furniture is of oak, trimmed with plush. One noticeable feature is the roomy promenade deck, having a passage completely around the outside of the cabin. This is permitted by the feathering wheels being below the deck. On the hurricane deck, the pilot house is large and roomy and abaft of it is an observation room, 25 by 30 feet, finished in natural wood. From this a view of the whole horizon can be had.

The incandescent lighting plant on the steamer, furnished by the Fisher Electric Company of Detroit, is peculiar in this respect—the boat is divided into eighteen circuits, the circuits terminating in engine room back of the working platform. The system of wiring is so arranged that the use of cut-outs are entirely omitted except on the switch-board. It is, therefore, under the immediate eye of the engineer. Each chandelier in

being adopted by the trade mainly on account of a great saving from breakage in the coal. Buckets of this pattern made lately are of five tons capacity, and as they are working very satisfactorily it is proposed to bring them into service on the Detroit river for the same reason that has made them a success in the cargo business, viz: a saving from breakage in the coal. Although definite arrangements have not as yet been made for entering into the river trade, it is proposed to construct a steamboat about 180 feet long, 35 feet beam and 8 feet deep. The buckets of large capacity could be loaded at Ohio ports, placed entirely on deck of the light draft boat and delivered to dealers along the rivers. A derrick for handling the buckets will be placed on deck, as shown in the drawing, with drums in the engine room. The derrick will have an arm capable of putting the buckets 25 feet back from the edge of the dock, and it is planned, of course, to have the supply sufficient so that the steamer making regular trips would replace empty buckets by loaded ones as demanded. A boat of this kind capable of making 9 or 10 miles an hour could, it is thought, run alongside steamers in the rivers and put fuel aboard them without the slightest delay.

With the large buckets referred to here a single derrick now being operated by the New York and Cleveland Gas Coal

Bucket Barge.  
for  
The Ludlow Mfg. Co.,  
— 1892 —



STEAMBOAT FOR RIVER FUELING BUSINESS.

the main cabin is placed on an independent circuit and lighted or extinguished from the engine room. The lighting of the boat is more perfect than any other steamer on the inland lakes, as she has 210 16 c. p. lamps so arranged and distributed that the illumination is complete. The generating plant consists of the Fisher Electric Company's marine engine and automatic dynamo of 250 light capacity. The illumination of the engine room has been carried to a high degree of perfection, all the rapid moving parts of the triple expansion inclined engine being made thoroughly visible to the eye of the engineer. The fixtures were furnished by the Fisher Electric Company and are finished in old brass.

The pumping machinery for the City of Toledo was furnished by the Chase Machine Company and consists of one 14 by 20 by 20 inches duplex independent condenser, two 8 by 4 by 10 inches boiler feed pumps and one special double duplex bilge and cold water pump 6 by 5 and 3 by 7 inches.

#### Bucket Barge for Fueling Business.

An engraving on this page shows the plans of the Ludlow Manufacturing Company of Cleveland for a bucket barge to be operated in connection with the business of furnishing soft coal for fuel to steamers on the St. Clair and Detroit rivers. This company is now manufacturing in large numbers soft coal buckets of the Ludlow pattern, which open at the bottom and are

Company on the Cleveland and Pittsburgh Railway docks, Cleveland, is capable of loading a vessel of 2,000 tons capacity in a single day. The derrick is of the revolving and self-propelling pattern, large size, and can be worked regularly at 200 tons an hour.

#### Grain at Chicago and Duluth.

Stocks of grain at Chicago and Duluth on Monday, June 20, were as follows:

	Chicago.		Duluth.
	Wheat, bu.	Corn, bu.	All wheat, bu.
In store.....	6,001,631	2,336,668	4,338,000
Decrease last week.....	503,926	.....	.....
Increase last week.....	.....	959,357	68,000
Excess over same time last year..	4,240,272	1,312,810	1,800,000

In addition to the above there is 1,061,857 bushels of oats, 173,931 bushels of rye and 18,256 bushels of barley in store in Chicago.

#### Phototypes of Lake Steamers.

The MARINE REVIEW has selected from the numerous supplemental illustrations it has issued, ten of the handsomest, including two photo-gravures, and has had them neatly bound. The City of Detroit, City of Toledo, Tuscarora, Chemung, North Wind, Pontiac, Maryland, E. C. Pope, Virginia and St. Ignace make up the list. These are the fastest passenger steamers on the lakes and the carriers of the largest cargoes. If you wish a copy sent postpaid to your address send 50 cents in stamps to the REVIEW.

# Lake Carriers' Association.

M. A. BRADLEY, President.

VICE-PRESIDENTS: { James W. Millen, Detroit, Mich. John G. Keith, Chicago, Ill.  
Frank J. Firth, Erie, Pa. W. S. Brainard, Toledo, O.  
Thomas Wilson, Cleveland, O. R. P. Fitzgerald, Milwaukee, Wis.  
Peter F. Miller, Buffalo, N. Y. Alex. McDougall, Duluth, Minn.  
Charles H. Keep, Secretary, Buffalo, N. Y. Geo. P. McKay, Treasurer, Cleveland, O.  
Harvey D. Goulder, Counsel, Cleveland, O.

## INCREASING MEMBERSHIP.

Six steamers and thirteen schooners and barges aggregating 11,000 net registered tons have been added to the membership of the association within the past week. The success of the new shipping offices at Chicago and Buffalo, where the work of the association is now equal to that of the old offices of the Cleveland association has been the means of bringing in a large number of schooners and small steamers from all parts of the lakes, and in order to encourage the owners of craft of this kind and give them the full benefits of the organization it has been decided to keep the membership list open this year until July 1. The association now represents about 575,000 tons.

## QUESTION OF SAULT CANAL DRAFT.

Mr. Harvey D. Goulder, who was delegated at the last meeting of the finance committee to call on Gen. Poe at Detroit and consult that officer regarding the claims of some owners that the policy of protection to the St. Mary's Falls canal lock has been carried so far as to result to the disadvantage of owners through a decreased draft of water, will have a lengthy report to make at the next meeting of the committee. Mr. Goulder found Gen. Poe anxious to enter into every phase of the question. "The matter resolves itself simply to one point," he said on returning to Cleveland. "Everything that has been done at the canal and all regulations now being carried out there emanate from orders given by Gen. Poe, and I am satisfied from my talk with him that the whole question, as far as the vessel owners are concerned, must rest with their approval or disapproval of his judgment. Gen. Poe is anxious to accompany representatives of the vessel interests to the canal this fall when the lock is pumped out and inspect the entire workings."

## FAVORABLE LEGISLATION IN THE SENATE.

Advices to President M. A. Bradley from Secretary Charles H. Keep, who has been in Washington for several days past, show that the aids to navigation for the lakes secured in the appropriations committee of the senate are greater in number than was reported in the dispatches from Washington. The list is as follows:

- 1st. Light-ship to cost not exceeding \$25,000 to replace the private light-ship at Bar point.
- 2nd. Two floating lights to replace the floating private lights at the Lime-Kiln crossing.
- 3rd. For moving the upper St. Mary's ranges in accordance with the recommendations of the light-house board.
- 4th. On Grosse Isle, Detroit river, range lights to center the channel from the foot of Fighting island to Mamajuda light.
- 5th. On north end of Mamajuda island, a light to range with the present light on Mamajuda island, to mark channel between Grassy island and Mamajuda island.
- 6th. For range lights above Grassy island Detroit river.
- 7th. Authorizing the light-house board to use the \$60,000 heretofore appropriated for Eleven-Foot shoal, Green bay, for the purchase or construction of one or more light-ships.

On account of failure so far to secure favorable action in the house on the bill authorizing the establishment of a large number of lights and fog signals in different parts of the lakes, vessel owners had about given up hope of securing any aid in this line from the present congress. The early passage of the civil sundry appropriation bill by the house was also against the light-house measure, and it is especially gratifying to find now that the most urgent items are to be provided for. There is no question about their passage in the senate. When the bill comes up in conference, however, the various lake members of congress must be urged to exert their influence with the members of the conference committee of the house. For this action

of the senate the obligations of all lake interests are due to Senators McMillan and Sawyer, as it was through personal efforts on their part that the appropriation committee of the senate was induced to insert these important items in the bill. Senator McMillan was especially instigative in securing the appropriations.

## PRIVATE LIGHT FUNDS.

Vessel owners will be pleased to learn that by the action of the senate committee on appropriations referred to above, there is now every reason for expecting that the private light expense of next season will be so small as to be of little importance. In the matter of meeting the expenses of the present season the association has been very fortunate in securing aid from the underwriters. Already the insurance companies have contributed \$800 toward the lights and three or four of the largest agencies are yet to be heard from.

## CHICAGO RIVER CURRENT.

It is to be hoped that the association will not consider the question of current in the Chicago river a local matter. The lake line agents of Chicago have protested against the proposition of the drainage board for a current of one and a half miles an hour in the river, and they should be upheld by the general organization in the declaration that one mile an hour should be the maximum current. The current in the Chicago river has seriously interfered with navigation all of this week. When it is considered that this current is not much if any swifter than the current which the drainage board intends making by the drainage canal it will be seen that the line agents are justified in their protest.

## Iron Ore Situation and Lake Freights.

Although the aggregate sales of non-Bessemer ores being made right along of late insures a fairly large movement of the Lake Superior product during the present season, the very low range of prices for the ore is, of course, almost as much to the disadvantage of the vessel owner as to the producer. Referring to one sale of non-Bessemer made last week, a dealer remarked in sarcasm that the ore man had given the furnace owner the ore and taken his cinder in return for it. In some cases sales have been made at fully 25 cents below last year's prices, notwithstanding the higher rates of lake freight that have ruled since the opening. The action of the Cleveland-Cliffs, Lake Superior and other big companies in reducing mining forces and marking down schedules of wages explains the situation. There is a general expectation of improvement in the iron market toward August, but it is only a hope that has been cherished for some time past. Under present conditions, and in view of the prospects of heavy shipments of low grade ores from the new Mesaba range next season, only a few of the stronger companies, such as the Minnesota, Lake Angeline, Lake Superior, Chandler and one or two others can be said to have any chance in a market such as that ruling for some time past. The fair rates of lake freight are entirely due to the grain and coal movement. Ore freights at this writing are 70 cents Escanaba, 90 cents Marquette and \$1.05 Ashland.

## Big Tank Contract.

Mr. H. D. Coffinberry, president of the Cleveland Ship Building Company, returned from Washington last week with a contract from the Haskins Wood Vulcanizing Company for four tanks, 108 feet long by 6½ feet diameter. They are to be built of three-quarter inch steel, double and triple riveted, to withstand a pressure of 250 pounds. The contract also includes three horizontal tubular boilers, 6 by 16 feet, two drying tanks, two heating tanks, two cooling tanks and two hoisting engines. The contract is equal to work on a large steel steamer.

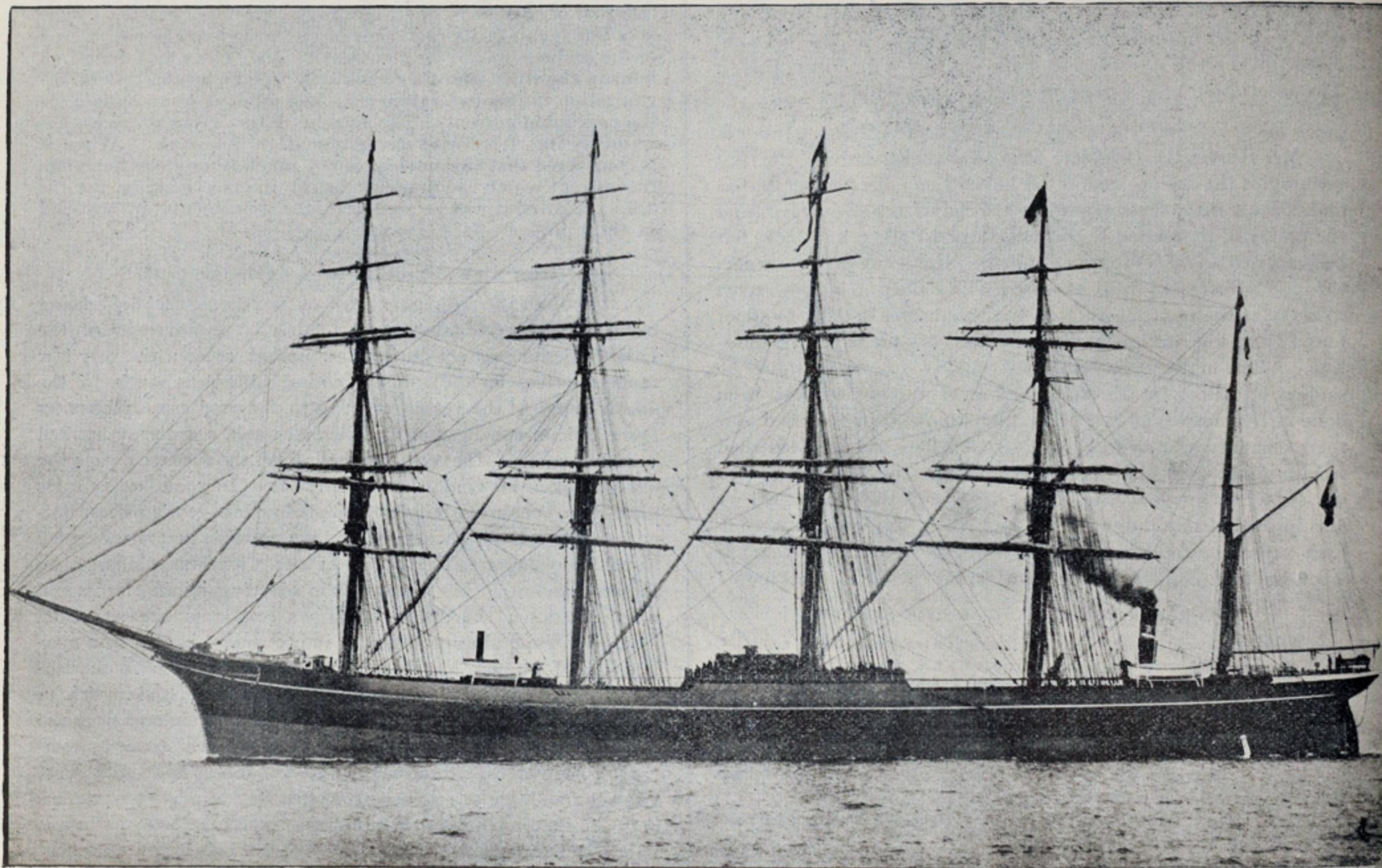
On and after July 1, 1892, during thick and foggy weather a bell will be sounded from the bell tower recently erected at Sherwood point light station, south side of entrance from Green bay into Sturgeon bay. The tower is a square pyramidal structure about 25 feet high, the lower part painted white, with a bright red roof. The bell will be struck by machinery a single blow every 12 seconds.

### Five Masted Ship Marie Rickmers.

The illustration below, presented through the courtesy of the American Shipbuilder, New York, shows the largest five-masted auxiliary steel sailing vessel in the world. She was built by Russel & Co., Glasgow and fitted with triple expansion engines having cylinders 16, 26 and 42 inches by 27 inches, and the indicated horse-power is 780. She was engined by Kincaid & Co., Greenock. Her tonnage is 3,813 gross; carrying capacity 5,850 tons. The vessel is owned by the Rickmers, of Bremen. During her trial trip last February the new ship made eight knots an hour under steam alone and with 1,560 tons water ballast, and coal on board. She is fitted with a double bottom and deep midship water tanks, capable of holding 1,300 tons water ballast. The propeller has always been a difficulty in the case of auxiliary powered sailing vessels. In the Marie Rickmers the difficulty has been avoided by the use of a Bevis patent gun metal feathering propeller, the blades of which can

### Regularity in Launches.

In all the vessels launched from the yard of the Globe Iron Works Company, Cleveland, within the past ten years, there is not a single instance where the time appointed for launching has varied a minute. The hour is 3 o'clock and the regularity with which the big steel boats built by this company have slid into the water at that time of the day is surprising when the detail connected with the launching of a vessel is taken into consideration. The work of clearing the blocks under the vessel is, of course, in all cases timed so as to be finished within a fraction of a minute before the hour, but if this work should be finished in advance of the time allotted for it and there was not too much of a strain on the vessel the ropes would not be cut until exactly 3 o'clock. At every launch Supt. John Smith is seen to keep an eye on his watch with as much care as he listens for the announcement from the men at both ends of the boat



FIVE MASTED AUXILIARY SAILING SHIP MARIE RICKMERS.

be feathered to any pitch, and be made to lie in a fore-and-aft direction when the vessel is under sail alone, the mechanism for doing this being worked from the engine room. The Rickmer's dimensions are as follows: Length over all 375 feet, on water line 360 feet, beam 48 feet, depth 25 feet 8 inches. To answer the question often asked as to which is the largest sailing vessel in the world, the following detail will suffice: The France, a five-master built of steel by D. & W. Henderson & Co., Glasgow, last year for Ant. Dom Bordes & Fils, Dunkirk, France, is 361 feet long, 48 feet 8 inches beam, 25 feet 9 inches depth with a tonnage of 3,784 tons gross and 3,624 tons net register. The carrying capacity of this leviathan is upwards of 6,000 tons dead weight. The difference in the capacity of the France and Rickmers is caused by the weight of machinery of the latter. The eye of the sailor will be attracted to the fifth mast and the two top yards and he must be pretty well informed if he can give their correct names. Any one sending the correct names of the masts yards and sails of this ship to the MARINE REVIEW with their address will receive ten handsome phototypes of lake steamers.

that all is clear. Why this care is exercised as to the hour for launching is not explained, further than that there is a desire for promptness in such matters. At the Wyandotte yard of the Detroit Dry Dock Company the clearing of the vessel and the cutting of the ropes is regulated by telephonic communication on the ground between the two ends of the vessel, but it is not probable that the time for launching is adhered to as strictly as at the Globe yard.

The Pennsylvania Railway and the Southern Pacific Company, the Mexican Central Railway and the Grand Trunk Railway have recently ordered experimental sets of Serve ribbed tubes. The Paris, Lyons & Mediterranean Railway has 200 locomotives fitted, some of them having been in use two years. These tubes are gradually being adopted for marine boilers in England and it is only a question of time until some enterprising builder on the lakes tries them. The Cunard and Inman line have put them in several steamers where they are making tests as against plain tubes with retarders.

## Iron Mining.

## VALUE OF LEADING STOCKS.

Quoted by Chas. H. Potter & Co., No. 104 Superior St. Cleveland, O.

Stocks.	Par Value.	Bid.	Asked.
Cleveland-Cliffs Iron Company.....	\$100 00	\$.....	\$ 75 00
Champion Iron Company.....	25 00	.....	60 00
Chandler Iron Company.....	25 00	43 00	46 00
Jackson Iron Company.....	25 00	.....	100 00
Lake Superior Iron Company.....	25 00	44 00	46 00
Minnesota Iron Company.....	100 00	.....	75 00
Pittsburgh & Lake Angeline Iron Co....	25 00	.....	147 50
Republic Iron Company.....	25 00	.....	18 50
Ashland .....	25 00	.....	.....
Section Thirty-three.....	25 00	.....	7 50
Brotherton.....	25 00	2 00	2 50
Iron Belt.....	25 00	2 10	.....
Aurora.....	25 00	8 25	.....

Shipments of iron ore from Two Harbors up to Wednesday, June 16, aggregated 231,489 gross tons, of which 133,081 tons was from the Chandler and 98,408 tons from the Minnesota mine. On the same date shipments from Ashland aggregated 487,717 tons, divided as follows: Ashland 50,911 tons, Aurora 78,387, Colby No. 2 14,969, Tilden 49,378, Iron Belt 18,019, Montreal, North vein 8,406, Palms 14,756, Brotherton 23,786, Carey 11,495, East Norrie 52,288, Newport 16,759, Norrie 102,873, Pabst 18,556, Sunday Lake 21,025, Windsor 4,919.

## Record of Speed and Big Cargoes.

[Masters or owners are invited to report improvements on this list.]

Iron ore: Lake Michigan—Maryland, Inter-Ocean Transportation Company of Milwaukee, 3,364 gross, or 3,784 net tons, Escanaba to South Chicago; E. C. Pope, Eddy Bros. of Bay City, 3,239 gross, or 3,628 net tons, Escanaba to Buffalo, draft 16 feet.

Grain: E. C. Pope, Eddy Bros. of Bay City, 125,730 bushels of corn, Chicago to Buffalo, draft 14 feet 8 inches; Western Reserve, Peter Minch of Cleveland, 112,431 bushels of wheat, Chicago to Buffalo; W. H. Gilcher, J. C. Gilchrist of Cleveland, 114,982 bushels of corn, Chicago to Buffalo.

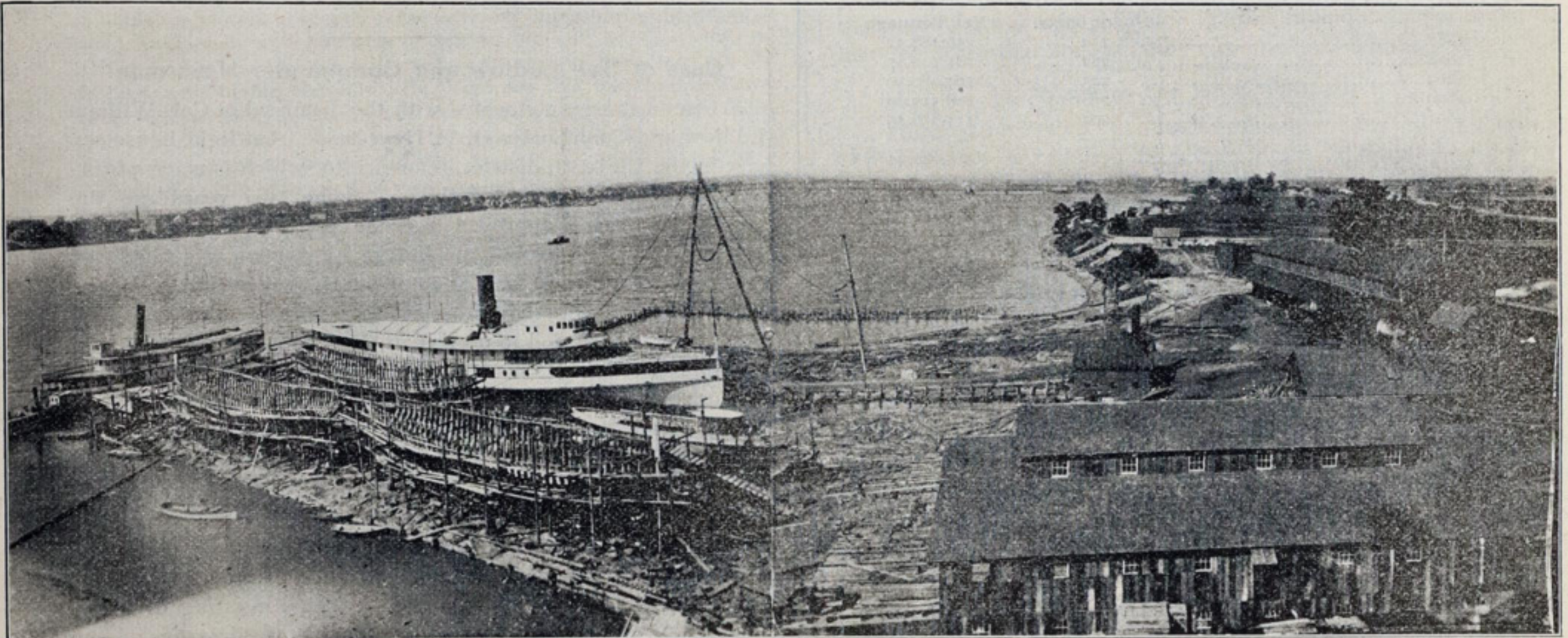
Speed: Owego, Union Line of Buffalo, Buffalo to Chicago, 889 miles, 54 hours and 16 minutes, 16.4 miles an hour; Saranac, Lehigh Valley Line of Buffalo, Buffalo to Lime-Kilns, 240 miles, 15 hours and 10 minutes, 16 miles an hour.

## Canadian Plans for the Grain Trade.

Special Correspondence to the MARINE REVIEW.

KINGSTON, Ont., June 23.—It is probably as well that a dull spell in marine matters is noted at present, as on Saturday last there were fully 2,000,000 bushels of grain stored at Montreal waiting for a change in prices before being moved across the ocean. There are also 700,000 bushels of rye and oats on the track, there being no storage accommodation available. Had the rush kept on there is no telling what would be the result.

At a recent meeting of the board of trade the elevator matter was brought up, with the result that negotiations are going on between the citizens and the



YARDS OF THE CRAIG SHIP BUILDING COMPANY—CITY OF TOLEDO ON THE STOCKS.

The consumption of iron ore in 1891, according to the annual report of the American Iron and Steel Association, was about 1,760,000 gross tons less than in 1890, or 15,740,000 tons, against about 17,500,000 tons in 1890. The decreased consumption in 1891 was borne chiefly by the producers of domestic ore. The imports of iron ore in 1891 amounted to 912,864 gross tons, against 1,246,830 tons in 1890.

## Freight Boat Records.

Under a standing head the REVIEW again prints records of speed and big cargoes made by freight steamers on the lakes. The steamer Maryland, built by the Detroit Dry Dock Company and owned by the Inter-Ocean Transportation Company of Milwaukee, has already improved upon her own record of last year, having taken 3,345 gross tons of iron ore out of Escanaba on June 6 for South Chicago. With the increased draft of water other big steamers will increase last year's records of grain and ore cargoes taken through the rivers, and masters or owners are requested to report to the REVIEW any improvement in either speed or big loads. The steamer Western Reserve this week took 3,017 gross tons out of Escanaba for Lake Erie, but her draft was less than last season's limit through the rivers.

SEND 50 CENTS IN STAMPS TO THE MARINE REVIEW FOR TEN PHOTOTYPES AND GRAVURES OF LAKE STEAMERS NEATLY BOUND.

Montreal Transportation Company. If arrangements can not be effected between this company and the city, it is probable that speculators in the west will be asked to step in, as it is understood they are willing to do so. If a 500,000 bushel elevator were erected here large quantities of grain could be brought on and even sold at this point. It is claimed that the investment would be a paying one.

On Saturday the Collinsby Rafting Company launched its new steel tug valued at \$30,000.

The damage to the propeller Glengarry, owned by the Montreal Transportation Company, which was badly burned ten days ago, has been placed at \$6,500. The same company nearly lost an elevator by fire on Friday night. Prompt assistance from shovelers kept the damage under \$100.

The range lights are now in position, and Capt. A. Milligan, a veteran mariner, has been appointed to look after them.

"Well, Uncle Reuben, that's a fine pair of oxen you have."

"Ya-as."

"What have you named them?"

"Nigh one's Pilot an' th' off one's Rudder."

"Strange names, aren't they?"

"Not fur steers."—Puck.

The R. M. Spedden Company has been incorporated with a capital of \$150,000 to continue the shipbuilding and engine building business of R. M. Spedden & Co., at Baltimore.—Cordage Trade Journal.

# MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

JOHN M. MULROONEY, . . . . . } PROPRIETORS.  
F. M. BARTON, . . . . . }  
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The books of the United States treasury department contain the names of 3,600 vessels, measuring 1,154,870.38 tons in the lake trade. In classification of this fleet the lakes have more steamboats of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of vessels of 1,000 to 2,500 tons on the lakes on June 30, 1891, was 310 and their aggregate gross tonnage 512,787.58; in all other parts of the country the number of this class of vessels was, on the same date, 213 and their gross tonnage 319,750.84. The classification of the entire lake fleet is as follows:

Class.	Number.	Tonnage.
Steam vessels .....	1,592	756,751.53
Sailing vessels.....	1,243	325,131.06
Canal boats.....	703	72,515.42
Barges.....	62	20,472.37
Total.....	3,600	1,154,870.38

Tonnage built on the lakes during the past five years, according to the report of the United States commissioner of navigation, is as follows:

	No. of boats.	Net Tonnage.
1887.....	152	56,488.32
1888.....	222	101,102.87
1889.....	225	107,080.30
1890.....	218	108,515.00
1891.....	204	111,856.45
Total.....	1,021	485,042.94

Entered at Cleveland Post Office as Second-class Mail Matter.

In another part of this issue will be found a plain statement of facts relative to the action to the light-house board, treasury department, in relieving Col. William Ludlow, corps of engineers, U. S. A., and Commander O. F. Heyerman, U. S. N., from the duties, respectively, of light-house engineer and light-house inspector in the Eleventh district, comprising Lakes Huron and Superior and the St. Mary's river. To put it mildly the action of the board in this case is the strangest proceeding ever attempted in the service, and it would not be surprising to those interested in the matter to learn eventually that there is a spirit of spitefulness or at least undue antagonism back of the whole affair. However this may be, it is certain that if such a thing is possible, through the unanimous assistance of the shipping interests directly concerned, these district officers will be given a hearing before being turned down on such causes as those appearing in their action toward the board. Since the announcement of the action of the board, protests in the form of telegrams and resolutions from leading vessel owners and commercial bodies in all parts of the lakes have been pouring in upon Secretary Foster, the board and members of the senate, and Vice-President H. M. Hanna with Secretary Keep of the Lake Carriers' Association are now in Washington, as the special representatives of lake interests, to ask that Col. Ludlow and Commander Heyerman be summoned before the board for a full investigation. An investigation is all that is asked, and if it is to rest upon the question of insubordination on the part of the district officers, there should be no trouble in proving to the secretary or fair minded members of the board that false lights should not be shown no matter who orders them. There was, however, no insubordination intended but an earnest endeavor on the part of the officers to discharge an important and difficult duty while seeking to save the board itself from most damaging action.

At last President Harrison has sent to congress a message covering the matter of Canadian discrimination against American citizens in Welland canal tolls. He recommends that congress,

with deliberation and yet with promptness, take such steps as may be necessary to secure the just rights of our citizens. This simply means retaliation if the Canadian government persists in its present course. President Harrison's statement of the subject is entirely in line with the claims which the shipping interests of the lakes have been pressing upon the state department for two years past.

ON July 1 the contract for patrolling St. Mary's river will expire, and as far as we can learn no appropriation has been made to continue the work. This is a matter that should demand the immediate attention of vessel owners. The care of the present contractor in attending to the buoys has undoubtedly saved the vessel interests from many losses and costly delays in the river. This work should not be stopped for a single day, but it will undoubtedly be suspended on the first of next month if not temporarily provided for.

CANAL street bridge in Chicago, against which the marine interests have waged war for two years, is being replaced by a bridge of the jack-knife plan, which gives one wide draw in the center of the river. So much for the disposal of one troublesome bridge question.

## Case of Col. Ludlow and Commander Heyerman.

Circumstances connected with the dismissal of Col. William Ludlow and Commander O. F. Heyerman from light-house service in the Eleventh district, reference to which is made editorially in this issue, were as follows: Some two years ago the light-house board approved a crude plan for lighting the St. Mary's river with thirty-eight lights. This plan was formulated without a close inspection of the river or careful consideration as to the actual number of lights required and their location, it being intended to do this in the customary manner after the appropriation was made and the work ordered. Early this spring Col. William Ludlow, engineer for the light-house board in the Eleventh district, was ordered to the Sault river to erect the necessary range lights preparatory to the lighting. Upon getting actively at work he discovered that the thirty-eight lights would not answer, changes in the channel having been made by the government dredging which were not taken into account at the time of the original location of the lights. The result of his work led him to adopt a plan consisting of forty-four lights, and under the modified scheme, by reason of the increase of lights on the shore and doing away with certain piers near the channel, the cost of establishing the whole system, consisting of forty-four lights, was about \$1,000 less than that required to build under the thirty-eight light plan. Col. Ludlow reported this to the light-house board, but was instructed that the thirty-eight light system must be adhered to. To this he protested, but without avail. The board instructed Commander O. F. Heyerman, inspector Eleventh district, U. S. N., to visit the Sault river and confer with Col. Ludlow in regard to the lights, the result of which conference was a united protest by both of the district officers, Ludlow and Heyerman, to the board against carrying out their orders to erect only thirty-eight lights as directed by the board. This protest was of no avail with the board, who ordered them to proceed with the work as directed. To this the engineer and inspector, who were on the river, signified a willingness to put up such of the thirty-eight lights as would not be misleading to navigation, but declined to erect those which if followed would carry boats away from the channel of the river and onto the rocks. The location of the ranges thus brought prominently into dispute, and which the officers declined to erect, were certain necessary ones at the "Black Hole" and Topsail island, two of the most dangerous places, as every Lake Superior sailor knows, on the Sault river. In reply to the stand taken by Col. Ludlow and Commander Heyerman the light-house board relieved them from their duties and ordered them to report at Detroit and await the arrival of their successors.

## CHICAGO LAKE INTERESTS.

WESTERN OFFICE, MARINE REVIEW,  
No. 13 Western Union Building, CHICAGO, ILL., June 23.

The world will ever admire physical courage, and the man who marches up to the cannon's mouth or otherwise exposes himself to great personal danger with a cool and unterrified front will always be a hero among men. For weeks Shipping Master Biemel has been abused, threatened by word of mouth, at least, and has been made the target of all the bitterness of the great fight between the Seamen's Union and the Lake Carriers' Association. It can be said to Mr. Biemel's credit that he has never picked a row with any of the union men, but it is equally true that he has slept on board many lake carrier boats with the hope that they would be attacked during the night by union sailors. The other day a lake carrier crew was taken off a schooner and marched to the union headquarters. Mr. Biemel did not call for a strong guard of police, but he went single-handed and alone to the headquarters of the union. The police cautioned him not to enter, but he was not to be frightened off. Fifteen or twenty delegates were here, but without a moment's hesitation he secured his men and started to leave the hall. One of the walking delegates drew a chair and threatened to brain him. He pulled out his revolver and covered his retreat out of the room, the lake carrier crew marching before him. Afterward two police officers with a search warrant found the dunnage of the kidnapped crew in the union headquarters, and that, too, was taken back to the vessel. It may have been a foolhardy act on the part of Mr. Biemel, but it showed the union that he was the kind of a man they were bound to respect.

Tugmen all around the lakes are complaining that owners are compelling them to become insurance companies, and that any damage in towing big steamers is saddled onto the tug. There is talk of a convention next winter of all the tug interests to adopt a uniform practice in regard to these damage bills. At Chicago they are very heavy, and are constantly becoming more so. Half of the minor accidents in the river here the tugmen claim, are directly the fault of the steamer captains. The latter are like the old-time kings. They can do no wrong in their own opinion and the tug companies are called upon to pay for it all. Competition between the lines has been so sharp that they have permitted this custom of paying damages to be well fixed, and they will probably continue to pay until there is a loss which may bankrupt them. Then there will be a big case in the courts and towing will be placed on a more legitimate basis.

Marine men here who are conversant with St. Mary's river are indignant that Col. Wm. Ludlow should have been relieved without any investigation. Col. Ludlow has made hosts of friends among Chicago marine men, and he has convinced them most thoroughly that he is not only in sympathy with the marine business, but that he understands thoroughly the requirements of navigation. A strong protest has been drawn up here and will be forwarded to Washington.

The picture of the late Capt. Thomas G. Crosby in last week's MARINE REVIEW caused general comment here. "It was the best likeness I ever saw in a newspaper" said Capt. Wiley M. Egan, and this was the general expression among marine men.

## Proposed New Entrance to Duluth and Superior Harbors.

Special Correspondence to the MARINE REVIEW.

SUPERIOR, Wis., June 23.—The matter of a new canal through Minnesota point is being agitated again. The canal known as the Duluth entry has never been a complete success. Whenever there is a heavy northeast storm the sea runs through the canal and spreads over the harbor in such swells as to prevent the safe loading or unloading of vessels. Mayor James B. Quinn and Capt. W. F. Fisk have had this disadvantage under consideration and at one time they planned a great breakwater to be placed two miles out in the lake. The undertaking was considered too enormous and it has finally been abandoned. Now the old central canal project is coming into favor again. By this canal is meant an opening 400 feet in width through Minnesota point opposite the strait between Rice's and Connor's points. Vessel men for the most part favor the central canal as it would give easier and safer access to both Superior and Duluth harbors. The heavy expenditure of money that would be required is, however, against the scheme.

## Official Numbers and Tonnage.

The bureau of navigation, E. C. O'Brien, commissioner, assigned official numbers to the following lake vessels during the week ending June 18: Steam—Choctaw, Marquette, Mich., 1,536.1 tons gross, 1,256.28 net, No. 126,874; Pioneer, Cleveland, 1,123.63 tons gross, 774.82 net, No. 150,589; Mansfield, Erie, Pa., 382.03 tons gross, 351.07 net, No. 92,437; Columbia, Buffalo, 399.31 tons gross, 281.35 net, No. 126,872. Sail—Ranger, Cleveland, 5.33 tons gross, 5.28 net, No. 110,436.

## Wrecks and Heavy Losses.

The schooner British Queen, which burned near Trenton, Ont., recently was owned by Capt. Smith of Toronto and valued at about \$1,000. She measured 117 net tons. William F. Upham's tug F. L. Danforth, which burned and sank near Superior entry, was worth about \$6,000.

## Shallow Spot at Waugoshance.

Capt. George P. McKay of Cleveland is in receipt of the following letter, which is self explanatory, from the master of a large wooden steamer engaged in the Escanaba iron ore trade:

"On June 16 my steamer, drawing 16 feet 4 inches, rubbed over a shoal of stones west of the red can at Point Waugoshance; the north can I mean, not Vienna shoal. We were on the ordinary course. A Western boat followed directly in our wake. This will not be a matter of news to those who have never hit this spot, but if they are deep enough and do hit it they will be as surprised as I was. I may have been nearer the can than is necessary, but due west about one-half a mile is where many boats pass, and a buoy is as necessary there, in addition to the one we have at present, as at any place I know of. I am positive iron bottoms at the draft noted, 16 feet 4 inches, would be injured. I am seeking no notoriety in the matter, but you have some pretty good men sailing for you, and just tell them that I hit a reasonable distance off that buoy and that they will find it better over toward White shoal. I touched or hit this spot four years ago at midnight in the fall of the year when drawing less water, and now as we are all loading to the last inch, it may be that some other fellow who has not had the experience of a surprise at this place will take heed and avoid it by keeping to the westward when deep laden. This is intended for particular men, who are thankful on being reminded of such things."

## Work of the Ship Yards.

Although a contract has not as yet been closed, it is more than probable that F. W. Wheeler & Co. of West Bay City will build a big steel steamer for Cleveland owners with whom they have had other dealings in the building line. Wheeler & Co. launched the big steamer W. H. Gilbert on Thursday last. Some idea of the increased size of boats of this class now building at different lake yards will be had when it is considered that the Gilbert is 28 feet longer than the Emily P. Weed.

S. F. Hodge & Co. of Detroit will build the big triple expansion engines that are to go into the whaleback passenger boat to be built for the world's fair service. In addition to work on this steamer, the barge company has started at West Superior two more freight boats on its own account. It is expected that next week three whalebacks, the two Canadian Pacific package freight steamers and a tug, will be launched in a single day.

The Globe Iron Works Company, Cleveland, will launch the last of the three Western Transportation Company boats next week. The second of these boats, the Mahoning, was launched by the Detroit Dry Dock Company at Wyandotte, Saturday, and the first of them to go into the water, the Codorus, at Buffalo, is well along toward completion at the yard of the Union Dry Dock Company.

## Ship Building in the East.

Kelley & Spear, Bath, Me., will build a stern-wheel boat for river service in Florida; draft only 28 inches.—The New England Company, Bath, Me., a few days ago launched a 105-foot excursion steamer that was engined by Brown & Miller, Jersey City.—The Bangor & Bar Harbor Steamboat Company has launched the 92-foot steamer built for themselves at Brewer, Me.—At Millbridge, Me., Joseph Sawyer is building a 900-ton schooner.—Everett White of Harrington, Me., has laid the keel of a 500-ton schooner.—Montgomery & Howard launched from their yard at Chelsea, Mass., for the Old Colony Steamboat Company a side-wheel freight steamer 294 feet long and 42 feet beam, the engines being furnished by the W. & A. Fletcher Company.

Thomas Murphy, John W. O'Keefe and Emil F. Krell have organized the Michigan Wrecking and Salvage Company with a capital stock of \$60,000. The headquarters will be at Detroit, and the company will carry on a general towing, wrecking and salvage business.

Capt. Watts, who was in one of the steel steamers of the Mutual Transportation Company last season and went out with Col. William Ludlow in the light-house steamer Warrington at the opening of the present season, has quit the latter boat.



Capt. Titus, recently in the schooner *Thomas Gawn*, has taken command of the schooner *David Stewart*. Capt. Shaw of *Marine City* takes the *Gawn*.

The American Ship Windlass Company of Providence, R. I., are sending their goods to all parts of the world in competition with other windlasses and capstans.

Local inspectors at Detroit have revoked the license of Capt. George Burns, who was in charge of the tug *Washburn* when John Hurley and Engineer W. F. Robinson lost their lives through the tug being run down by the steamer *City of Mackinaw*.

A new tug for the Maytham line of Buffalo, now nearing completion at that port, will be 92 feet long, 19 feet beam and 10 feet hold. She will have a high pressure engine, 24x28 inches, built by Sutton Bros. The Hand & Johnson line of the same place will also have a new tug ready for launching about July 15.

The death of John L. Schrader, marine reporter of the *Buffalo Courier*, occurred in this way: He went aboard the *Scranton* on invitation of Capt. Green, of the steamer, and was going down the ladder between decks when one hook gave way, letting the ladder suddenly swing about and throwing him down the hold.

On Wednesday of last week at 8:30 p. m., the new steel steamer *Samuel Mitchell* left Cleveland for Escanaba and was back again at 3:30 p. m. Sunday with 2,757 gross tons of ore, making the trip, port to port, in 3 days and 19 hours. The *Mitchell* bids fair to prove the most satisfactory freight boat built on the lakes during the past winter.

Emmons Blaine, son of the ex-secretary of state, whose sudden death was announced from Chicago last week, had but recently been elected president of the reorganized Chicago Ship Building Company. His death must have been a severe blow to the great statesman and is regretted most earnestly by all who have met the young man in a business way.

Samuel F. Hodge & Co., of Detroit, Mich., have adopted the plans of the Berlin Iron Bridge Company, of East Berlin, Conn., for their new foundry and have placed the contract with this company for the construction of the building. The general dimensions of the building are 86 feet in width by 161 feet in length. On each side there is a wing 23 feet in width. In the center of the building there will be a traveling crane to run the full length of the building. In the wings of the building are jib cranes, so that when completed every inch of the floor space will be controlled by power, either from the traveling crane or from the jib cranes. The construction will be entirely of brick and iron.

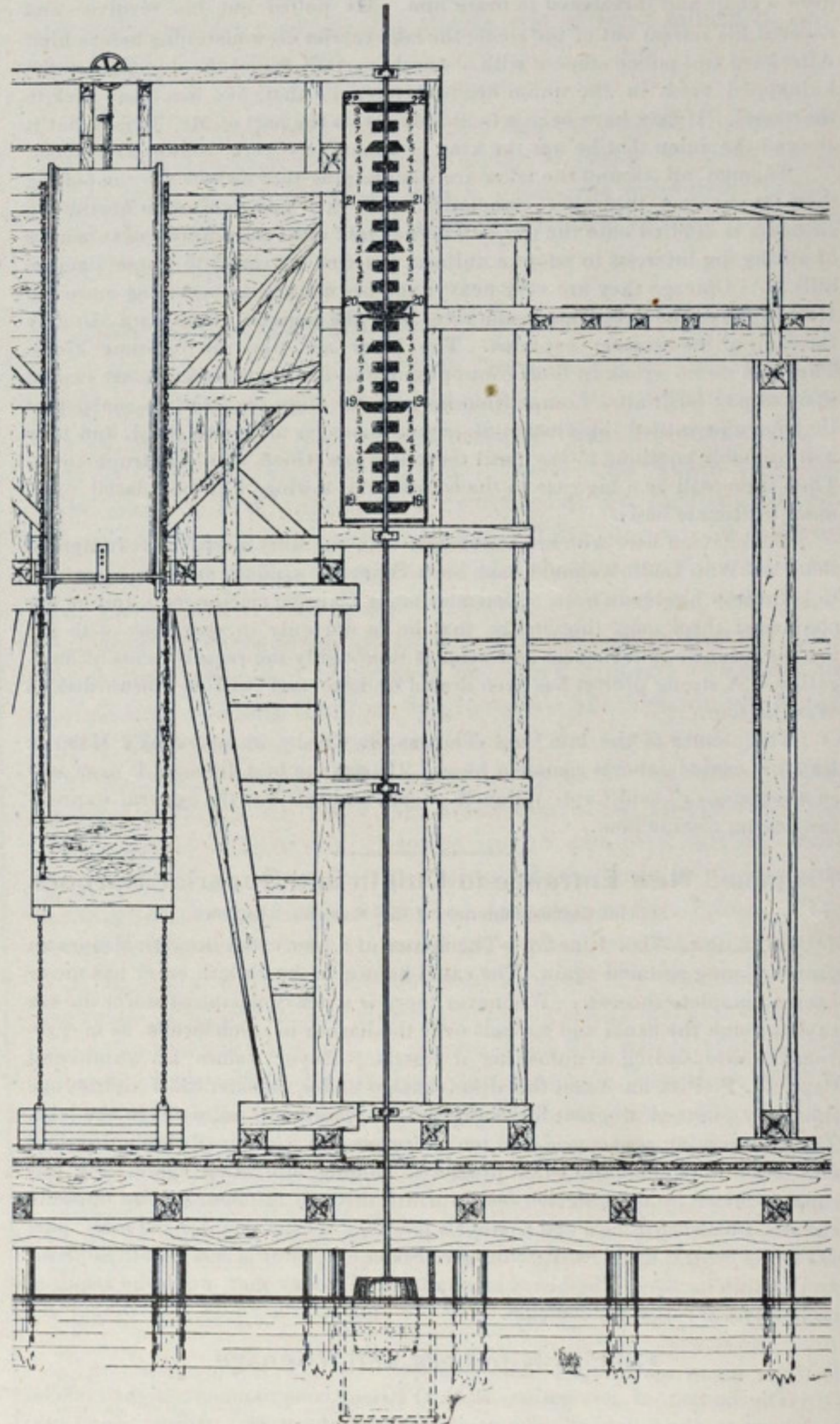
The United States lake survey party, with Lieut. C. S. Riche and Herman Kallman, Jr., in charge has been engaged for the past three weeks at Point Pelee, Lake Erie, surveying the outer shoals three miles west of the point. The first shoal they discovered contains 40,000 square feet, with boulders of all shapes and sizes, and the least depth of water over it is 16 feet. The second shoal is 125 feet long and 50 feet wide and is made up of a conglomeration of boulders of all shapes and sizes, and the least depth of water 13 feet 5 inches. They also found the wreck of the *Nichols*, lost in 1872 and loaded with iron ore, which is close to the channel and over which there is a depth of 13 feet 6 inches. The party is now at Colchester and has so far located one shoal of large rocks and boulders with water over it to the depth of 17 feet 5 inches.

When the six boats now under way at Davidson's West Bay City yard are completed, Capt. James Davidson will have turned out at that place forty-eight craft, twenty-three of which are steamers, seventeen schooners or tow barges and eight tugs. The first vessel was the *Kate Winslow*, built twenty years ago. The list, exclusive of three steamers, two schooners and one tug now under way and not named as yet, is as follows: Steamers—

Oceanica, Siberia, George T. Hope, Australasia, Roumania, Bulgaria, Germanic, Britannic, George G. Hadley, S. S. Wilhelm, Majestic, Alex Nimick, John Harper, Walter Vail, Lizzie Madden, Panther, City of Berlin, City of Paris, City of Glasgow and City of London. Schooners—E. M. Davidson, Laura Bell, Kate Winslow, Polynesia, John Shaw, Mary Woolson, Mary B. Mitchell, Tokio, Adriatic, Baltic, Atlanta, Nirvana, Celtic, Harold and Wahnapiæ. Tugs—W. H. Alley, Temple Emery, Washburn, C. B. Strohn, Geyser, Andrew McLean and Maxwell A.

#### A Valuable Water Level Guage.

In times of low water last season a large number of big lake carriers rounded to at the River Rouge and telephoned to Duff & Gatfield at Amherstburg to learn the depth of water at the Limekilns. At considerable expense Stanley B. Smith & Co., who operate the fueling dock near the Rouge, has erected a

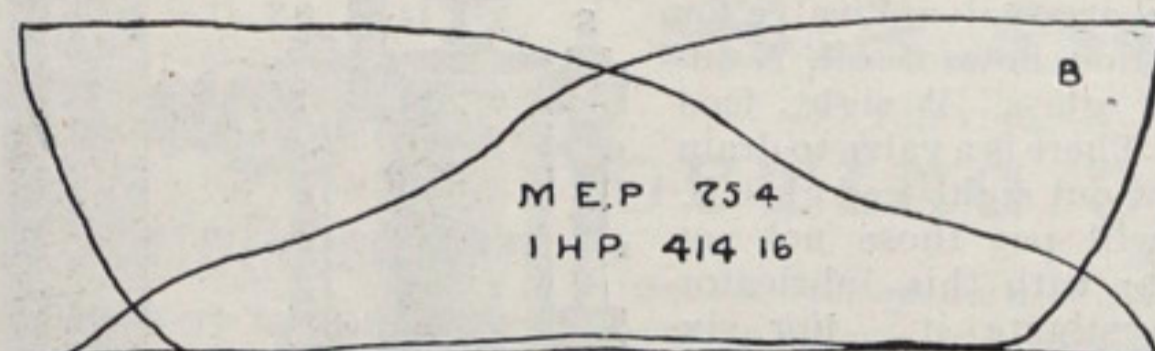


water level guage and connected it with an indicator board 35 feet above the water. The board is black and the white figures showing inches and feet are 1 and 3 inches in height respectively, the pointer being painted red. With the aid of government engineers the barrel which operates the guage has been set so that the indicator points out the depth at the Limekilns, thus saving deep-laden boats the trouble and time of rounding to, as by means of a glass the stage of water can be easily read from the center of the channel. It is certainly an aid to navigation and the enterprise thus shown is quite commendable.

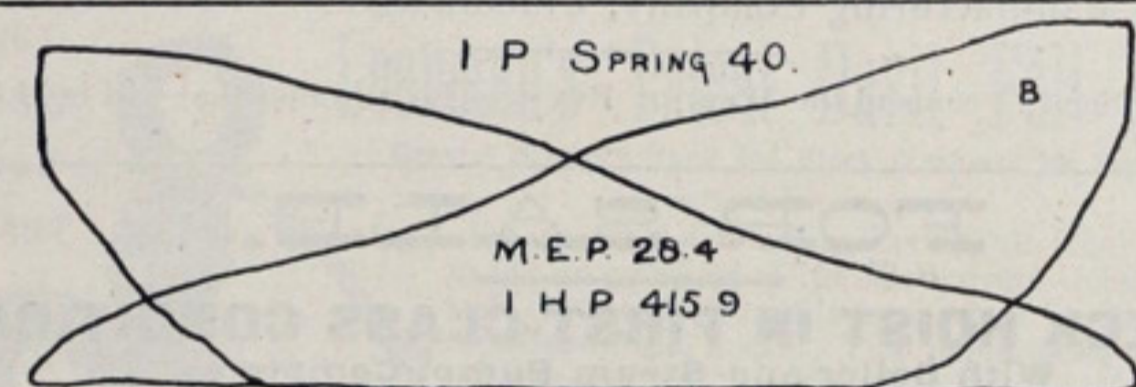
## Indicator Cards From the Uganda's Engines.

These cards were taken from engines built by the Frontier Iron Works, Detroit, for the steamer Uganda while she was on Lake Superior May 19, loaded. The steam at the time was 155 pounds, vacuum 25 inches, revolutions 86, cut-off, high-pressure 23 inches. The cylinders are 20, 32 and 54 inches by 42 inches. The total indicated horse power is 1,204.76. They show a high duty on that cut-off. The engines are fitted with a Dean Bros. (Indianapolis) independent condenser, which maintains a high vacuum under all loads and gives a hot well temperature of 110 degrees, the feed water being 198 degrees. The Uganda logged  $12\frac{3}{8}$  miles per hour, loaded, at 80 revolutions, and at 88 revolutions made 12.9 miles.

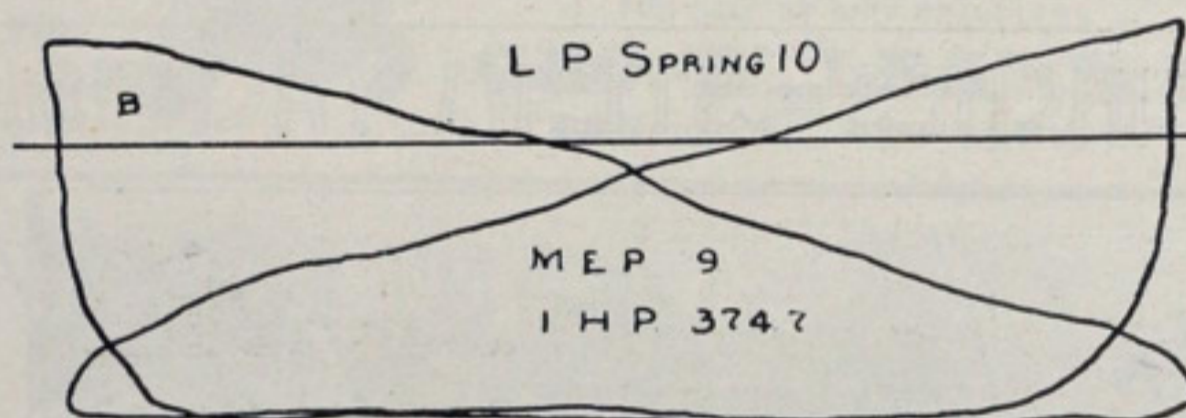
H. P. SPRING 80.



I P SPRING 40.

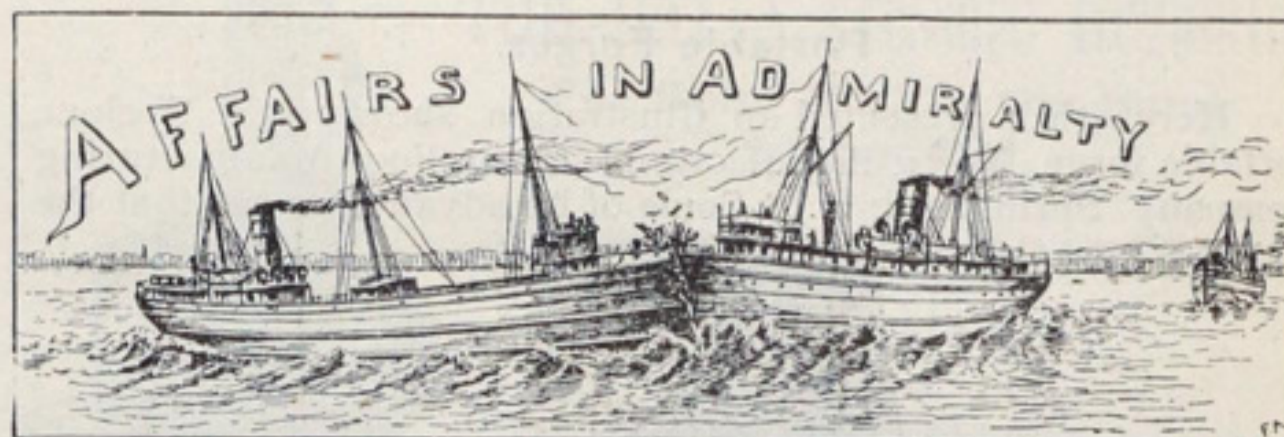


L P SPRING 10



## Prospects For Engineers on the Pacific Coast.

In a letter to the REVIEW W. L. Webster, at one time engineer of the big lake steamer Chemung but now located at Portland, Ore., says: "For a number of reasons I would not advise lake engineers to come to the coast in search of employment in their business. To begin with, shipping as well as work in machine shops is very quiet at present, although it is the general opinion that improvement will come soon. A large number of boats in this vicinity are laid up and altogether Portland is not the place to come to. There is more than a sufficient number of engineers for river boats here already, and the rate of wages is not equal to that of boats in the east carrying an equal number of passengers. Wages on the river are from \$65 to \$100 a month, with hours short in some cases and very long in others. Engineers on boats that run the year around do fairly well and those going to sea are also well paid. On ocean boats wages range from \$150 to \$180 according to the size of the steamer, the latter rate being paid only in a few instances, but the number of these ocean boats coming into Portland at present is very small. Probably not more than ten of them are running regularly to this port at present. Engineers seeking positions ashore are, on the other hand, very liable to be suited, although wages are not of the best and they will not fall into work immediately upon arrival here. If they can refer employers to reliable people in the east and can afford to wait a short time they are about certain to get a situation and will have no trouble in working into a good place in time. An employee of any kind in this part of the country is given very fair treatment. He is not turned down for trifling causes if his services are any way near what is right. With the vast amount of timber here the demand for engineers in saw mills will increase continually. New electrical plants and large mills will also increase the demand for the better class of engineers, but as I said before there is little to tempt lake engineers to give up good positions and come out here with the expectation of making a fortune. Only ocean-going steamers have any more help in the engine department than is found on the lakes. At some future time I will try to give you an idea of conditions ruling in San Francisco and the prospects for engineers at that port."



Judges Wallace and Lacombe of the United States circuit court of appeals, second circuit, sustained the district court recently in a case of sailing vessels meeting, regarding which the court made the following summary: "A brig and a schooner approached each other on a clear night, the brig sailing free on a course W.  $\frac{1}{2}$  N., and the schooner close-hauled on an E. by N. course. On conflicting evidence it was found that the schooner held her course, continually exhibiting to the brig her green light, and that the red light of the brig was seen on the schooner's star-board bow some time before the collision. The brig collided with and sank the schooner. It was the duty of the brig, sailing free, it was held, to have avoided the schooner sailing close-hauled, and for her failure to do so the brig was in fault. The mere fact of a vessel's sinking by reason of a collision is not sufficient to warrant a finding that she and her cargo are a total loss; and where it appears probable that they may be raised without much expense, and the vessel repaired, owners are not allowed to insist upon damages, as for a total loss, when they have not employed reasonable measures to mitigate the loss. But when a vessel worth \$3,800 was sunk in deep water, as in this case, and was afterward raised at a cost of \$1,900, and repairs were put upon her to the extent of \$6,800, the wrongdoer is liable for only the value of the ship, cargo, freight and personal effects on board before the collision.

It is the duty of seamen to remain by the wreck of a vessel so long as their personal safety will permit, and save as much as possible from the vessel; and when they have done so the fragments of the vessel and the outfit saved constitute a fund pledged for payment of their wages, superior to the claim of the salvors—Judge Dyer of the United States district court, Wisconsin.

Where two tows are approaching each other in a narrow channel in such wise that by continuing on they will meet at a point where it is difficult and dangerous for them to pass, it is the duty of the tow going against the current or tide to stop before reaching such difficult point, and wait for the other tow to go by her.—United States District Judge Brown, New York.

## In General.

Capt. Watts of Windsor accepted \$7,000 and the wreck of the tug Saginaw as it lies for the full insurance of \$8,000. The hull is being raised and will probably be rebuilt.

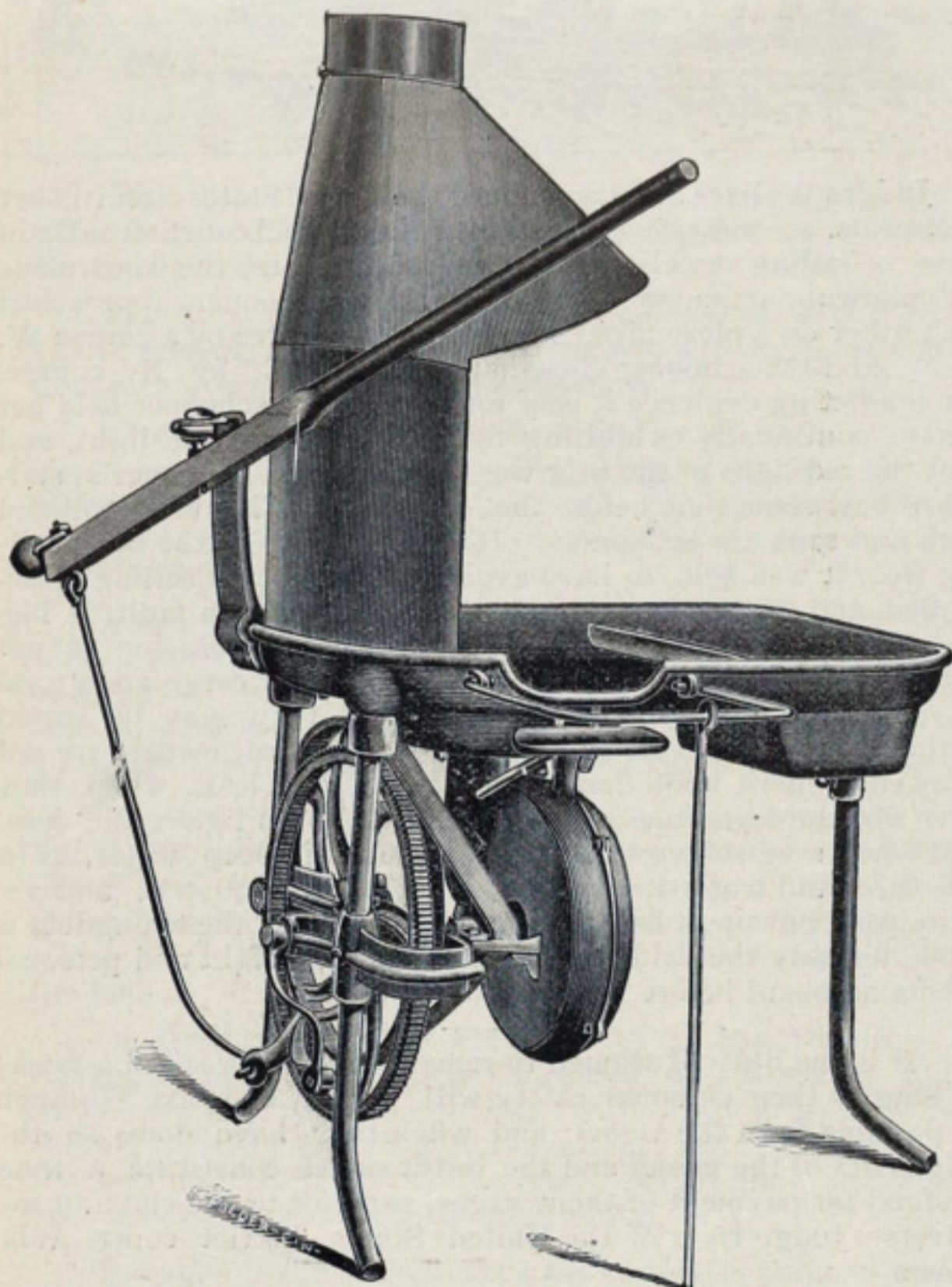
In the City of Paris Howden's system of forced draught has been fitted. This system consists in supplying warm air to the fires at a pressure of about  $1\frac{1}{2}$  inches of water. Howden's spiral retarders are also used in the tubes. These have the effect of delaying the passage of the heated gases whereby the latter impart their heat to the tubes. The consumption of coal per day is about 310 tons. The only steamer on the lakes with this appliance is the Pioneer, recently launched by the Detroit Dry Dock Company.

P. Stanch of Chicago has recently patented in this country and in Great Britain a screw propeller for steamboats, which has for its objects the overcoming of the loss of energy, due to the lateral displacement of water. The cutting sides of the blades is flat, and offers the minimum of resistance, the edge lying in the plane of revolution. The opposite side is concave, terminating in a curved tip, the curvature being sufficient to bring the edge and tip in the same direction as the shaft, which carries the blades. The effect upon the water is to force it in a straight line back from the boat so that the entire reaction is communicated to the vessel exactly in the direction of her forward movement. This form of blade being inoperative when reversed, a second series is placed upon the shaft, immediately forward and in the opposite position, for the purpose of backing the vessel.

Send 50 cents in stamps to the MARINE REVIEW for ten phototypes and gravures of lake steamers neatly bound.

## Portable Forges.

Herewith is presented an illustration showing the Cyclone portable forge, No. 1, manufactured by the Foos Manufacturing Company, Springfield, O. Some of its advantages are that the



operating lever is attached to a ratchet lever three or four inches outside the rim of gear wheel, thus giving increased leverage, so they are started and run easier than any other. The detachable lever is hung on a ball joint, and swings on a chilled seat; can be instantly removed for convenience in shipping or storing. The lever does not turn in the smith's hands when operating, but in the ball joint, thus giving precisely the same movement as the lever on the old-fashioned bellows, so pleasant and desirable, and found, it is claimed in no other forges. For further particulars and prices write the company.

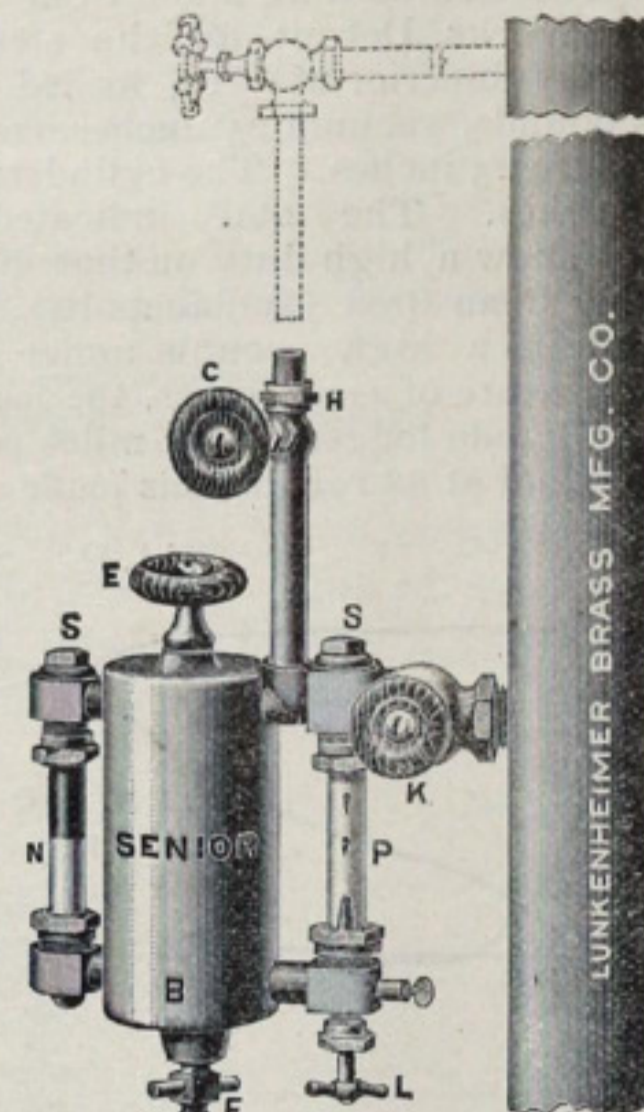
No admiralty lawyer, vessel owner or captain can afford to be without Patterson's Illustrated Nautical Dictionary, containing 5,000 nautical definitions and 500 descriptive engravings. If you send \$5 to the MARINE REVIEW for it and are dissatisfied with the book we will refund the money on return of book.

## A Simple and Practical Sight Feed Lubricator.

Lunkenheimer's improved Senior sight feed lubricator is acknowledged by all users to be the most satisfactory and perfect working cup on the market, and is guaranteed to give entire satisfaction.

Following is description referring to letters on illustration: B oil reservoir, C upper valve, E filling plug, F drain valve, H union to connect condenser pipe and valve, K discharge valve, L valve for regulation flow of oil, N indicator glass, P sight feed glass. There is a valve to drain or blow out sight-feed glass P.

It will pay those not yet familiar with this lubricator to investigate it. For six reasons why it is superior to other lubricators and for a handsome 1892 catalogue send your address to the Lunkenheimer Manufacturing Company, Cincinnati, O.



Send 75 cents to the MARINE REVIEW for a binder that will hold 52 numbers.

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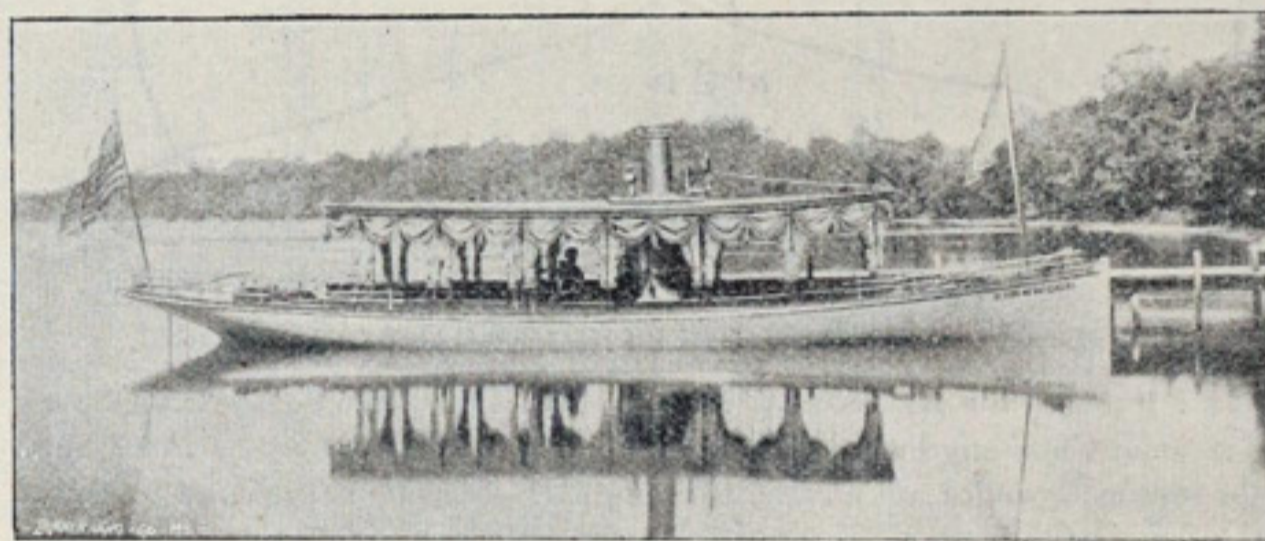
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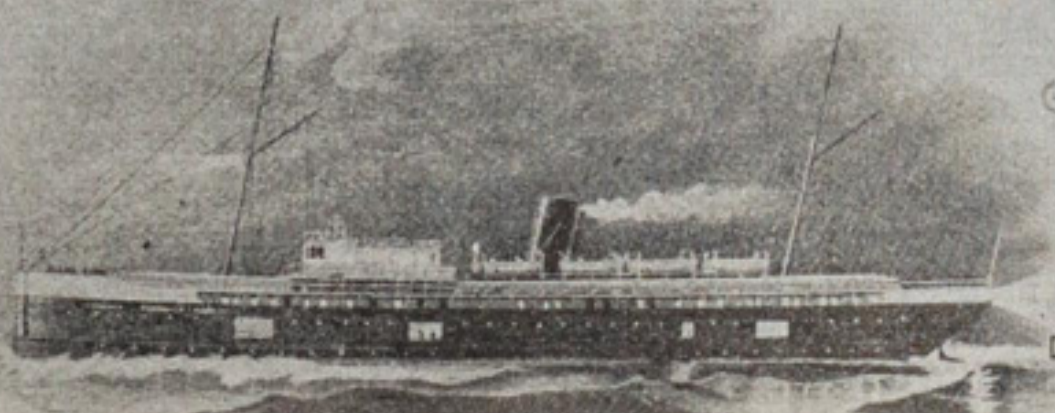
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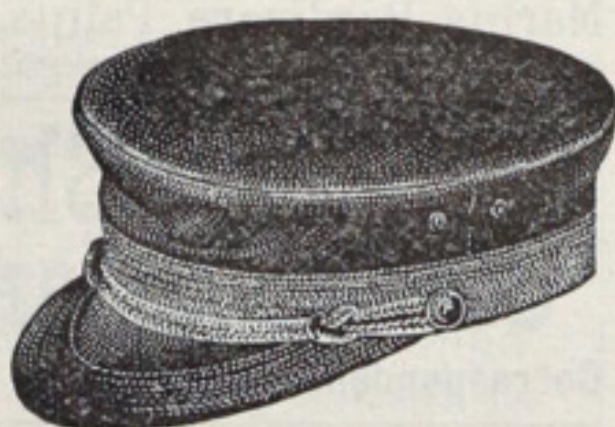
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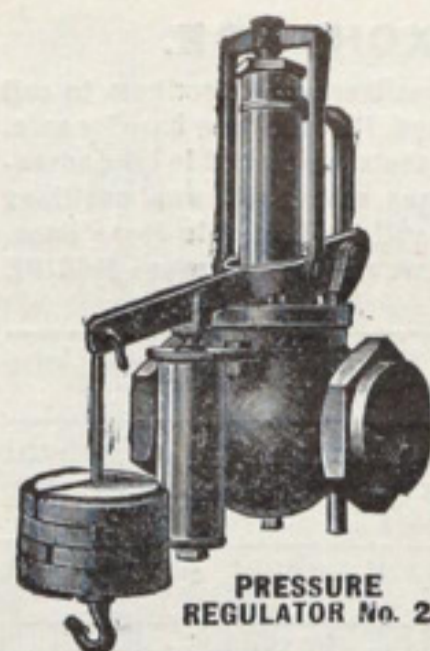
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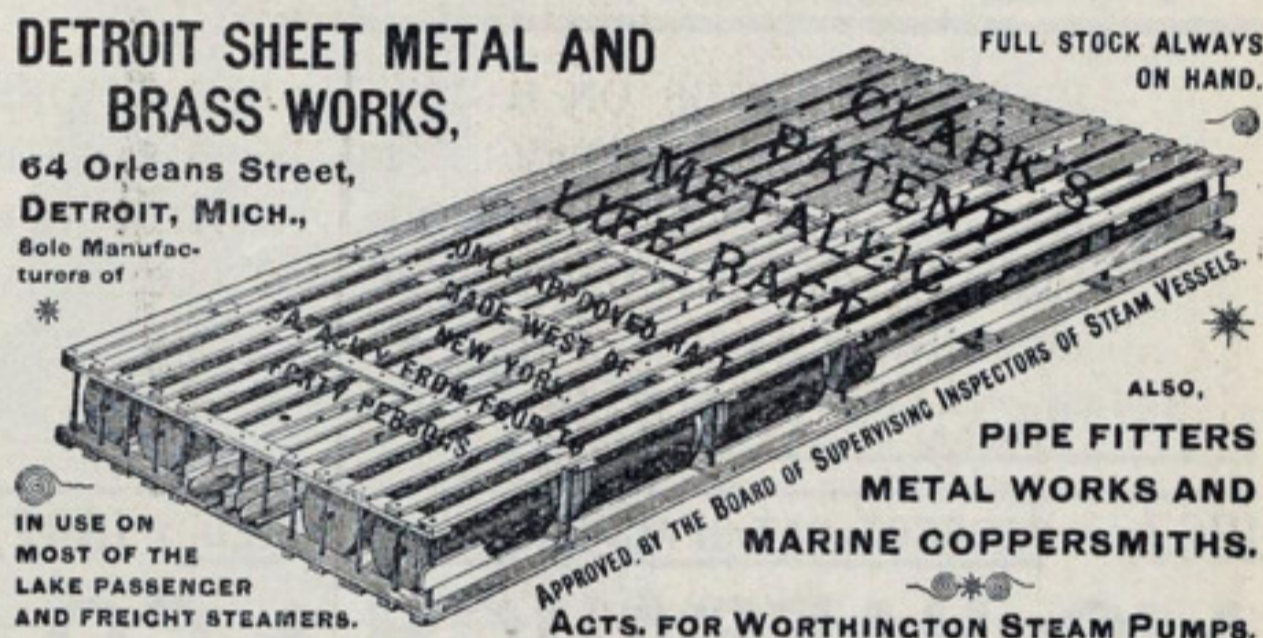
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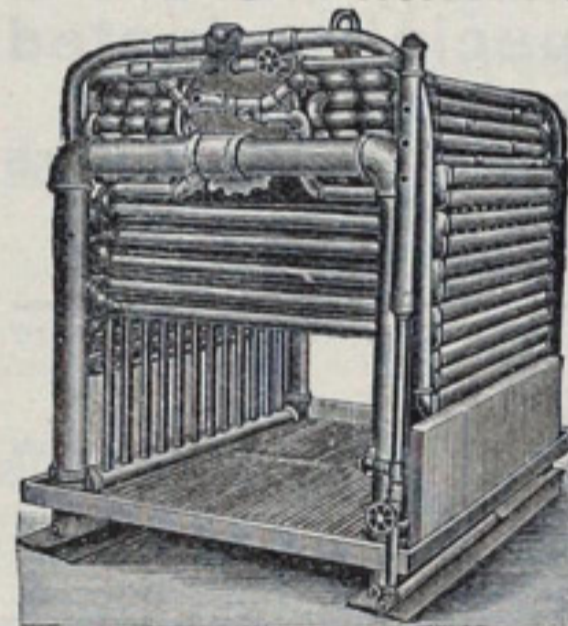
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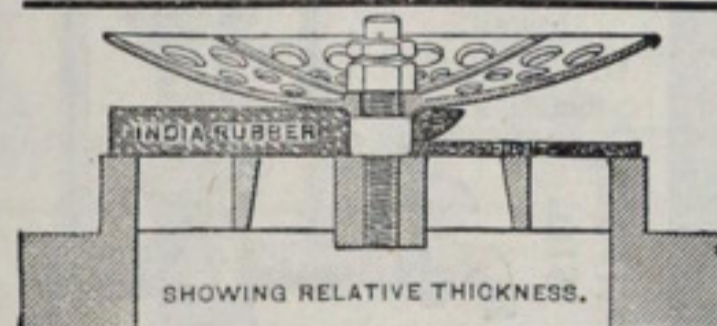
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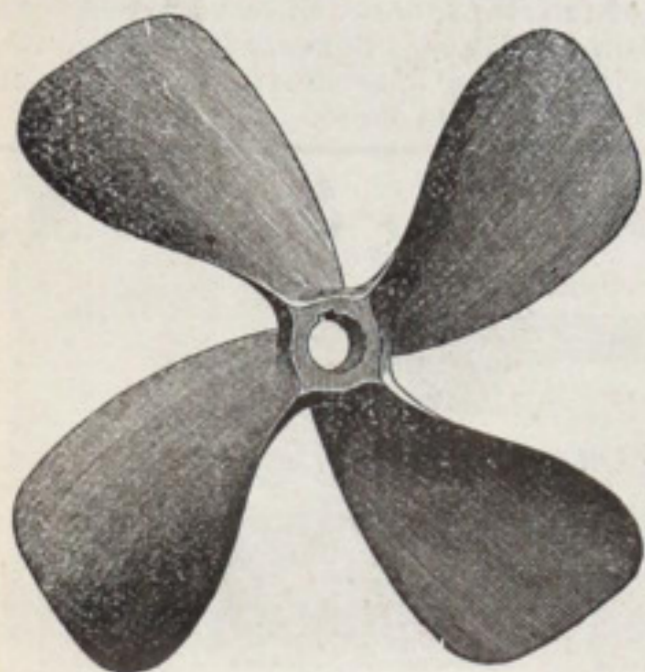
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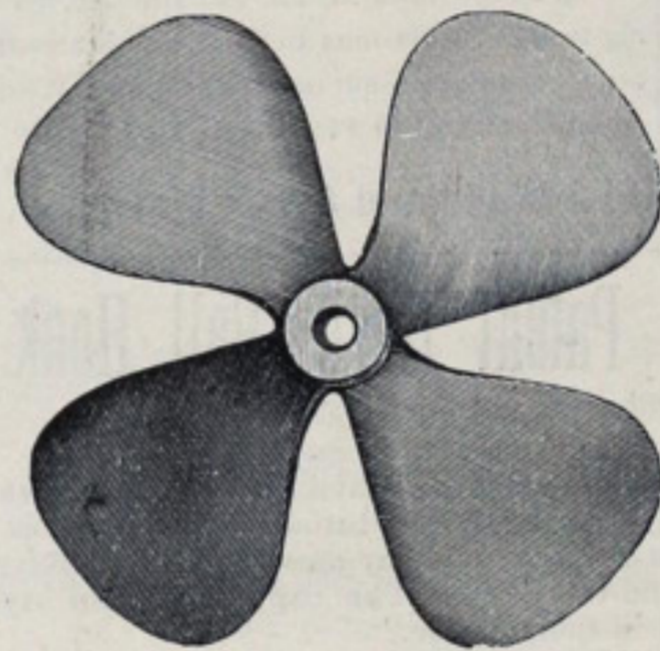
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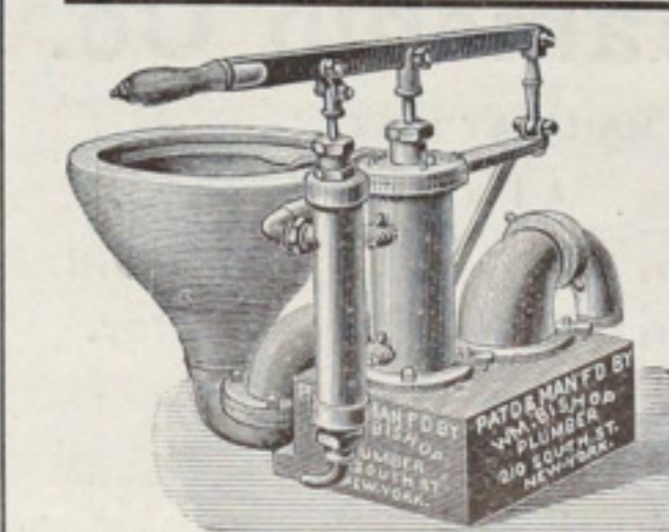
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West Congress street, Detroit, Mich., June 2, 1892. Sealed proposals in triplicate, for furnishing all plant materials and labor, and excavating in St. Mary's Falls Canal, Michigan, will be received at this office until 2 o'clock, p. m., July 2, 1892, and then publicly opened. Preference will be given to plant and materials of domestic production or manufacture, conditions of quality and price (import duties included) being equal. Attention is invited to acts of Congress, approved Feb. 26, 1885, and Feb. 23, 1887, vol. 23, page 332, and vol. 24, page 414, statutes at large. The government reserves the right to reject any or all proposals, or to waive any informalities in the bids received; also, to award the contract upon other considerations than the price. For further information apply at this office, or at the United States Engineer Office, Sault Ste. Marie, Mich. O. M. POE, Colonel, Corps of Engineers, Bvt. Brig. Gen., U. S. A.

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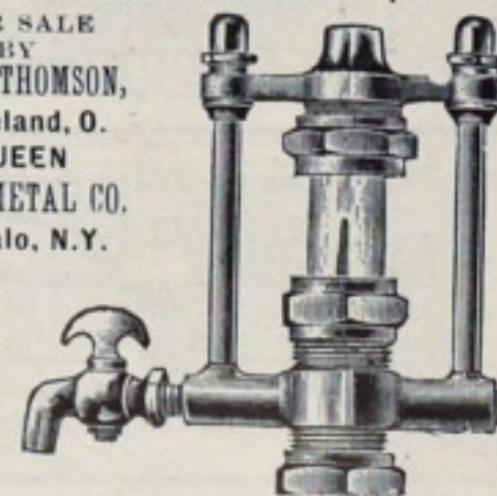


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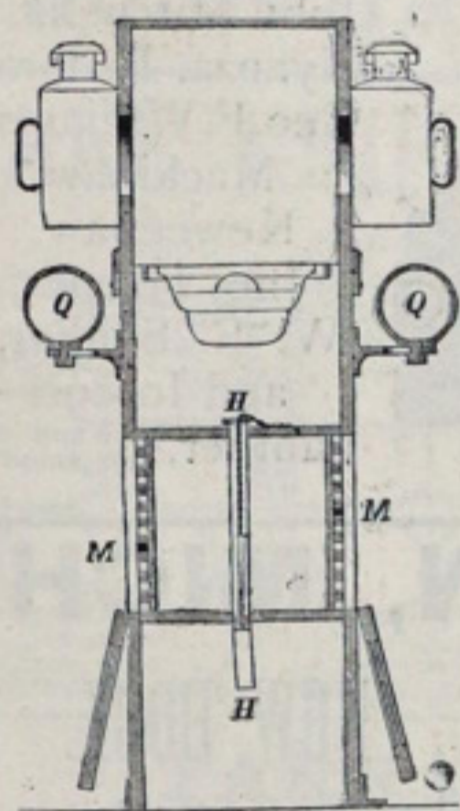
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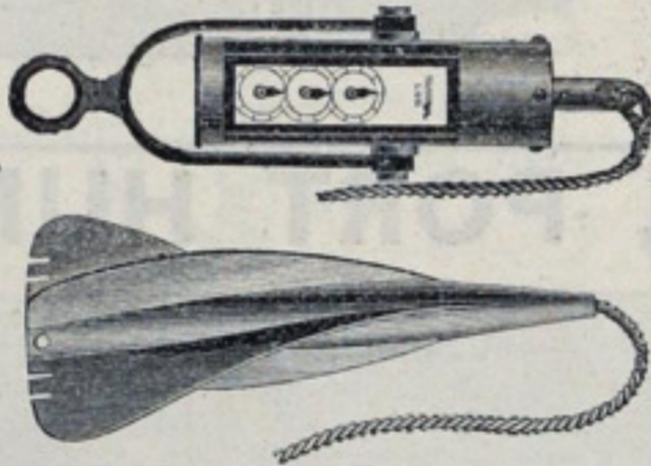
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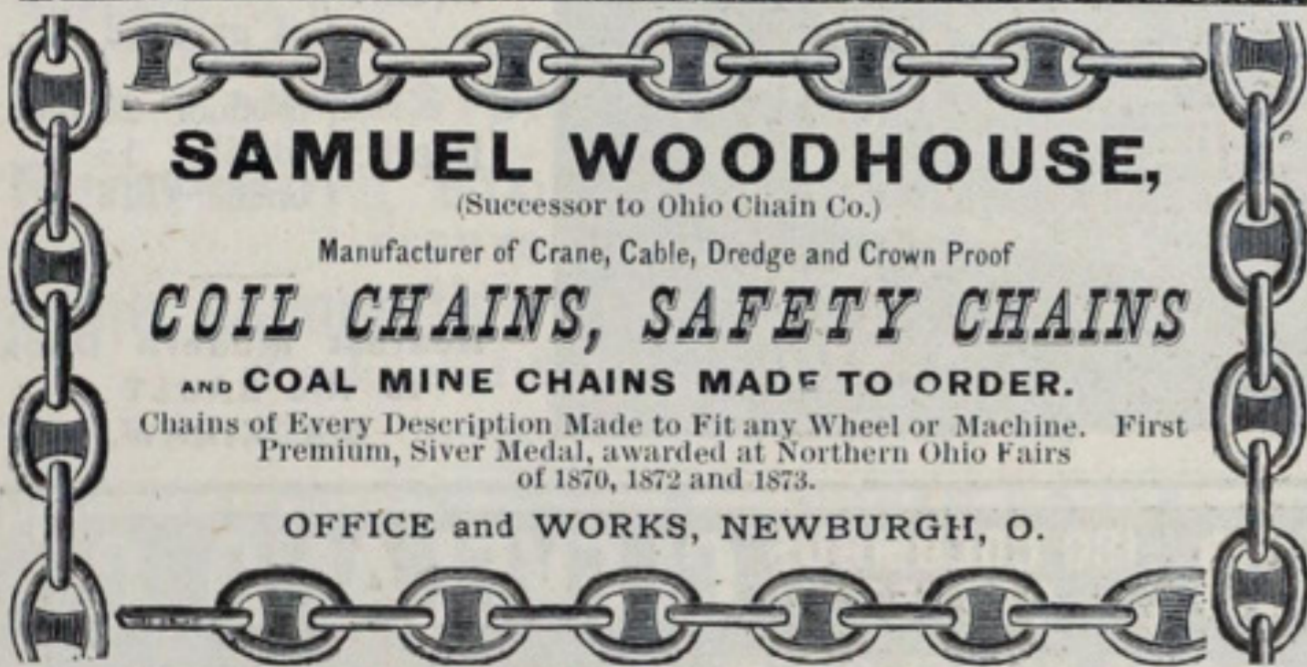


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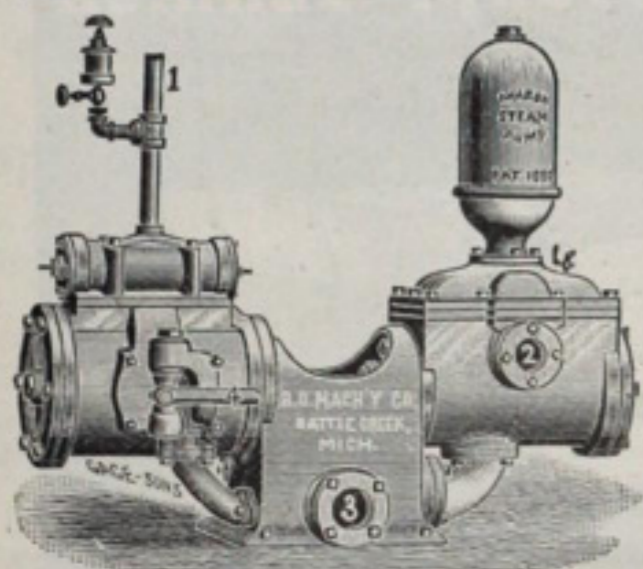


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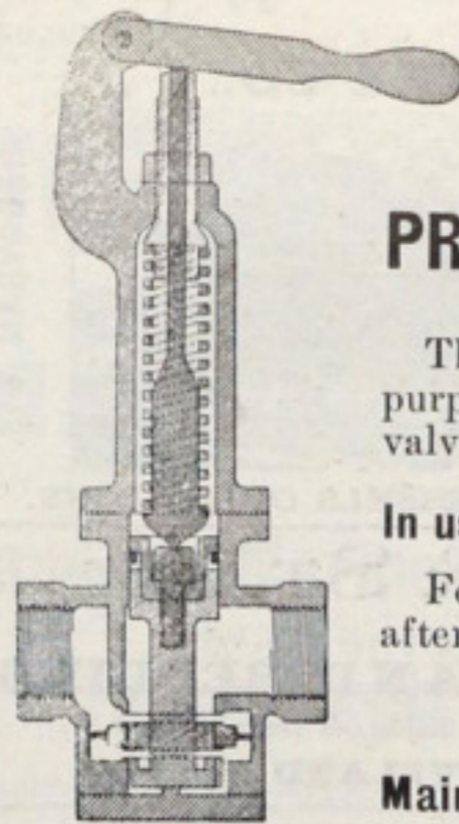
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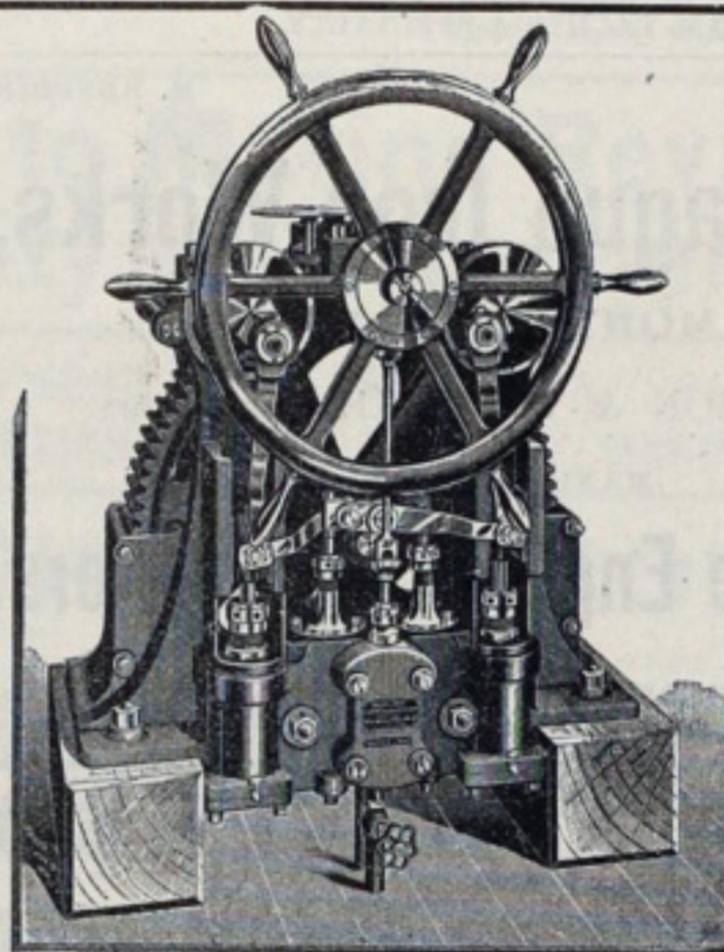
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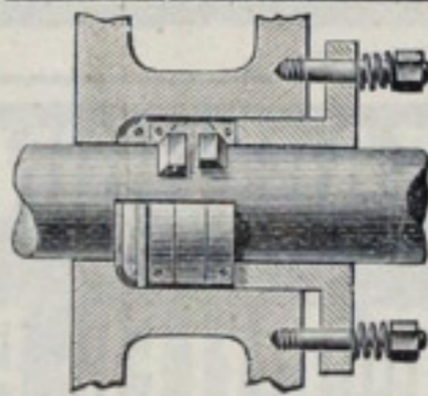
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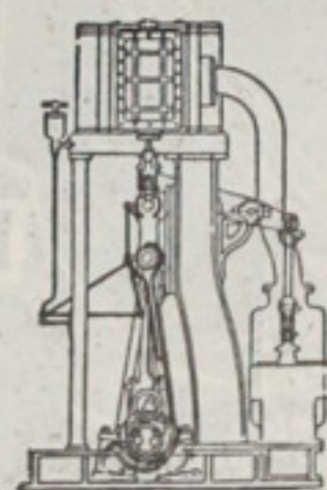


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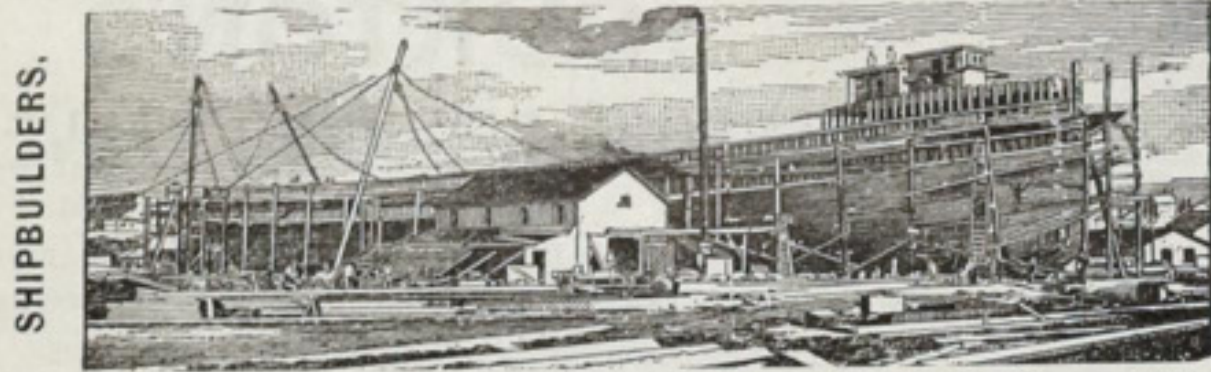
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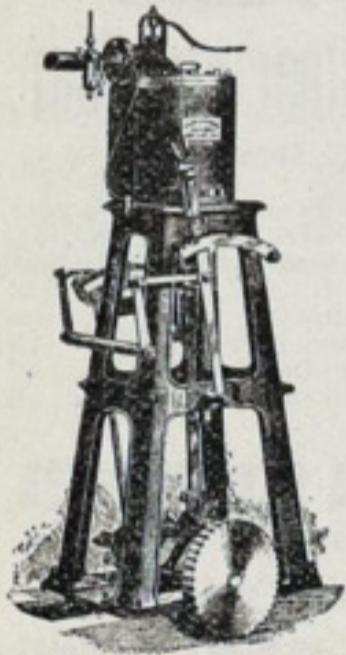
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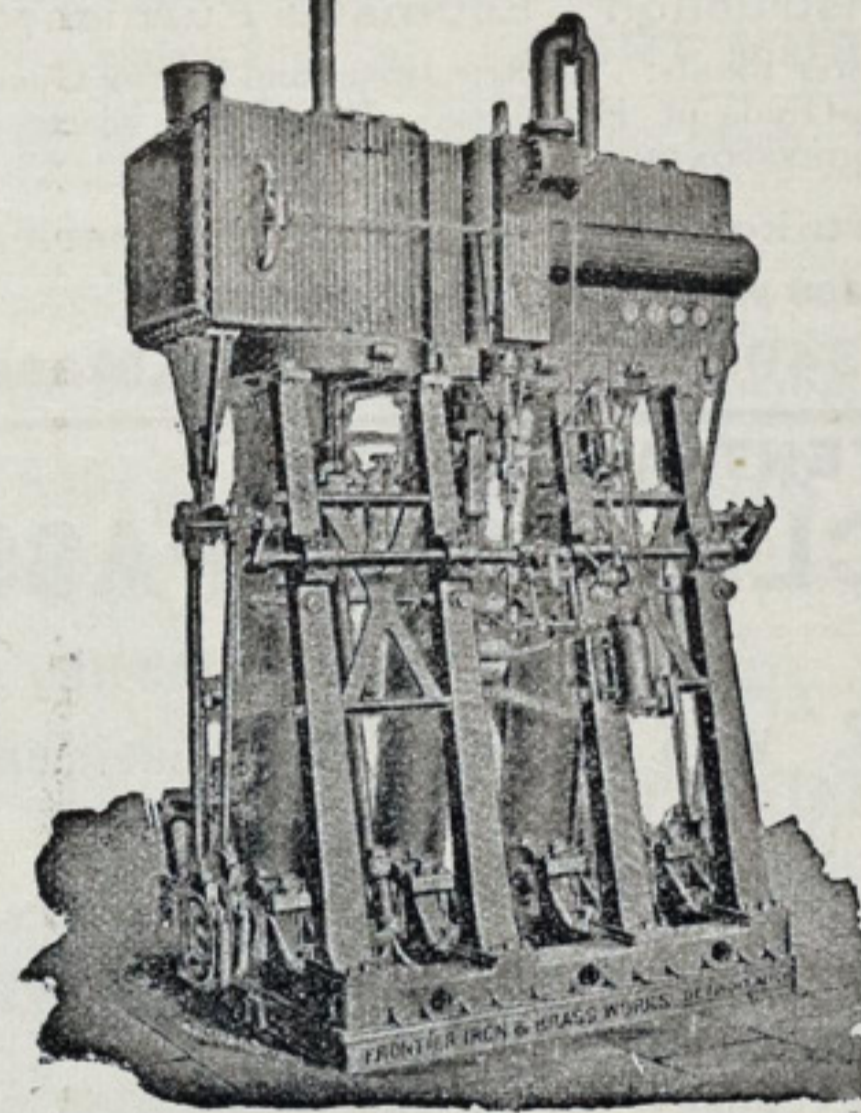
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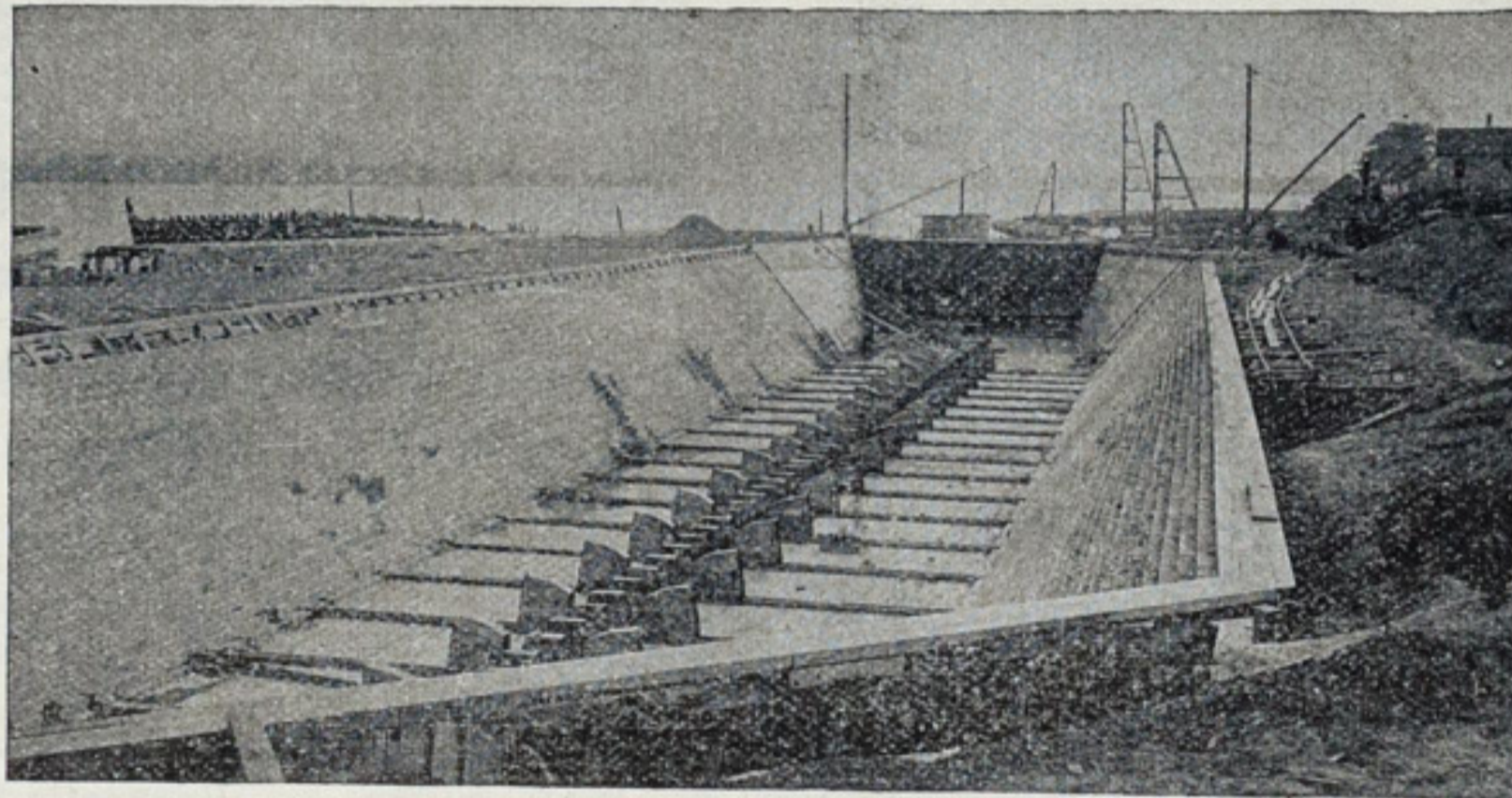
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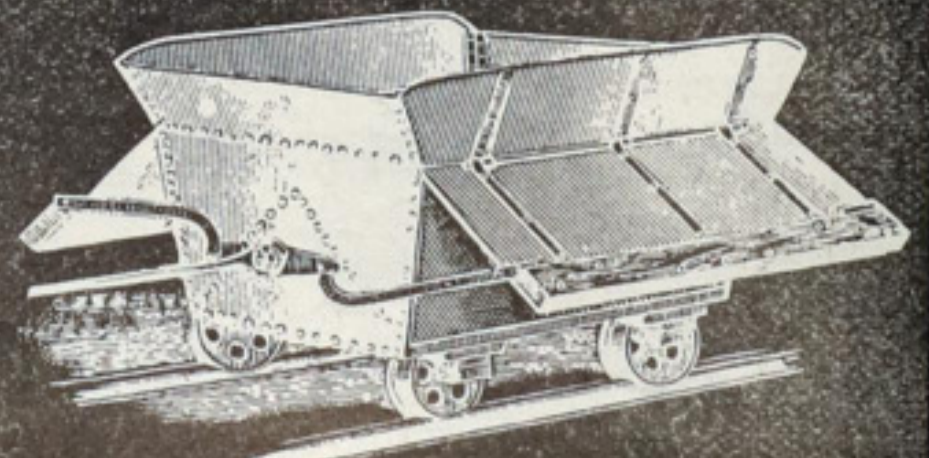
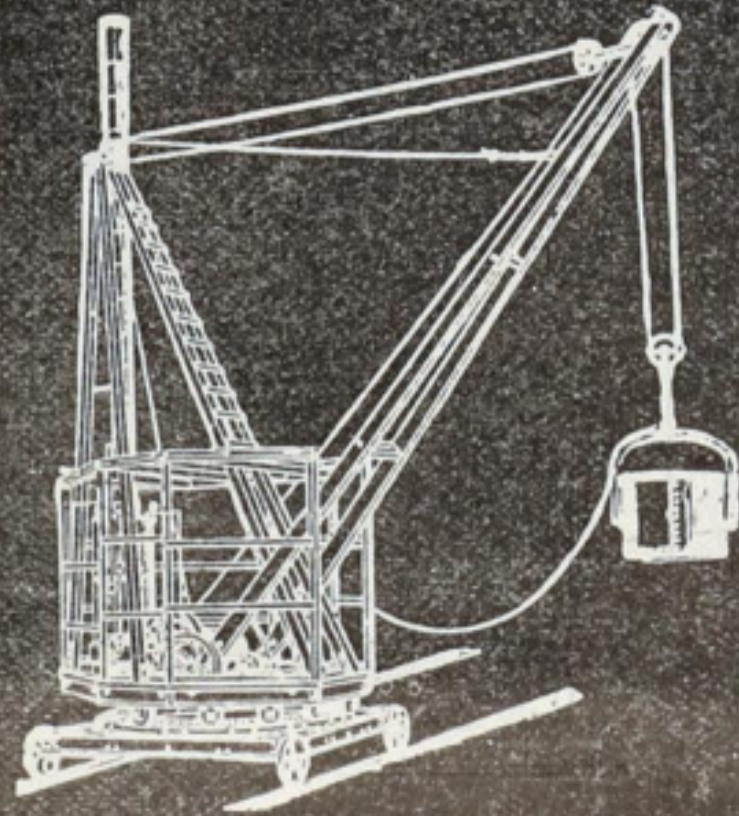
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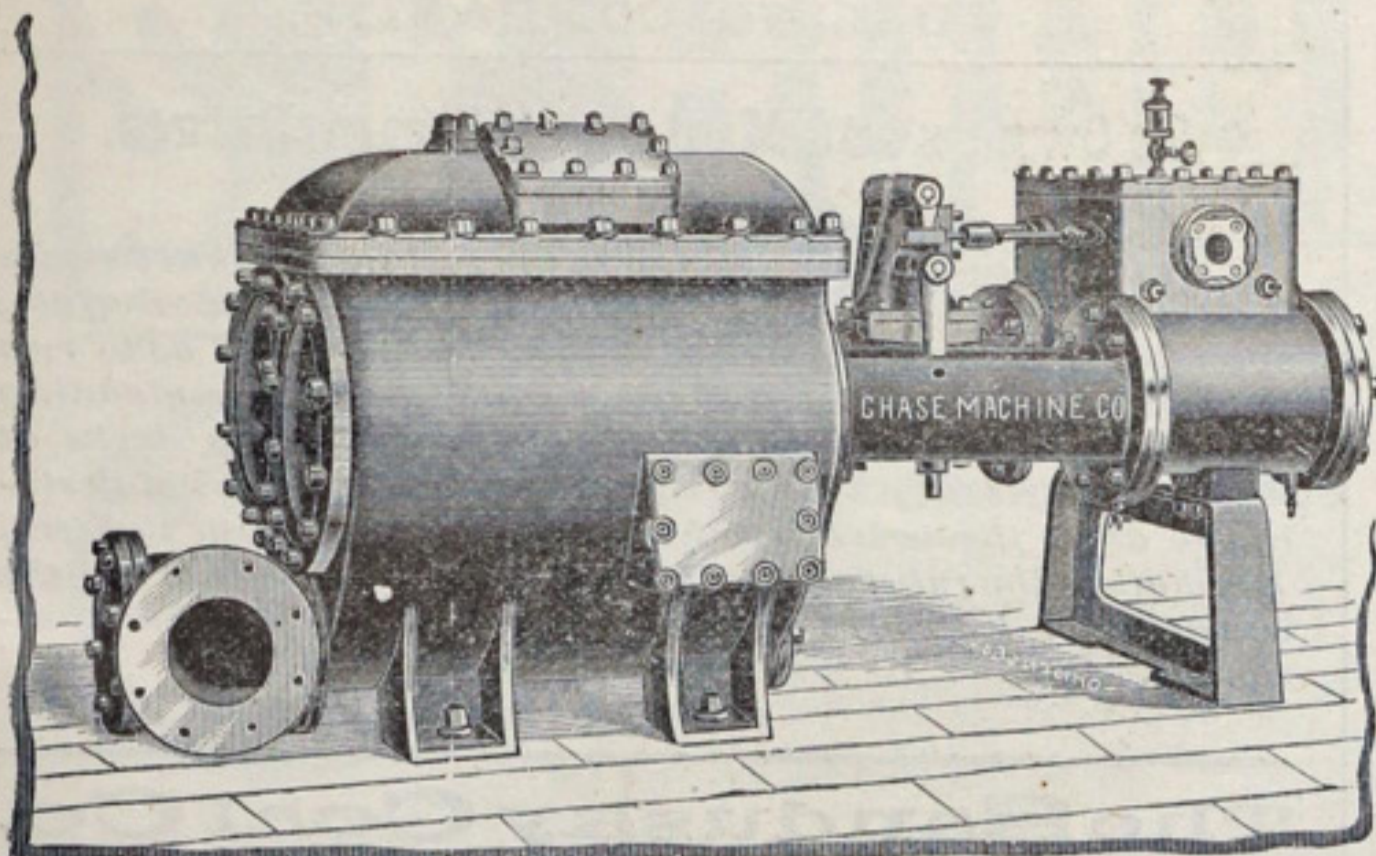
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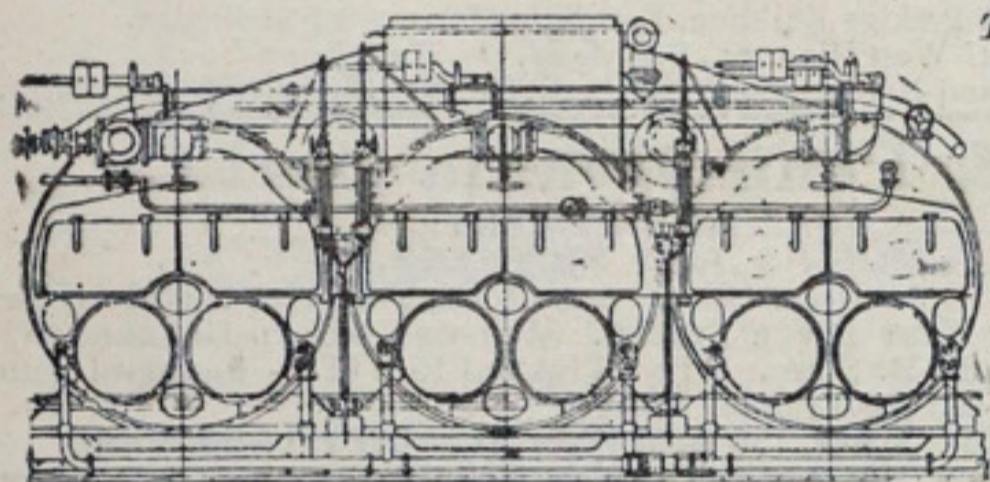
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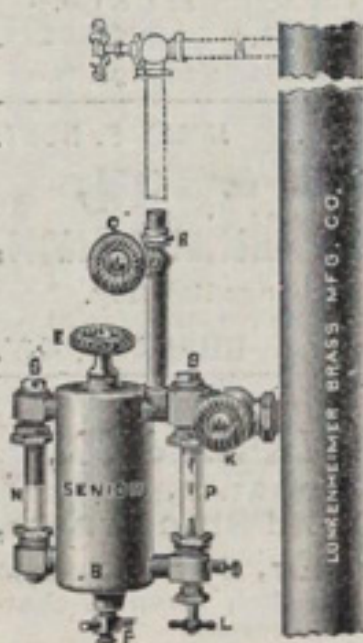
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### New Bridge Wall for Boilers.

Boiler capacity is the next problem that must be solved before any great advance can be made in marine engineering. It is quite certain that advancement in making steam has not kept pace with improvements for using it. Whether this is because the designer and mechanical engineer thinks his work on boilers would not be appreciated so much as it is on the engine, which writes recommendations or criticisms of new designs and theories on indicator cards, it is difficult to say, but the engine is now in a position to ask to be let alone and have some of the attention that has been showered on it given to the boiler.

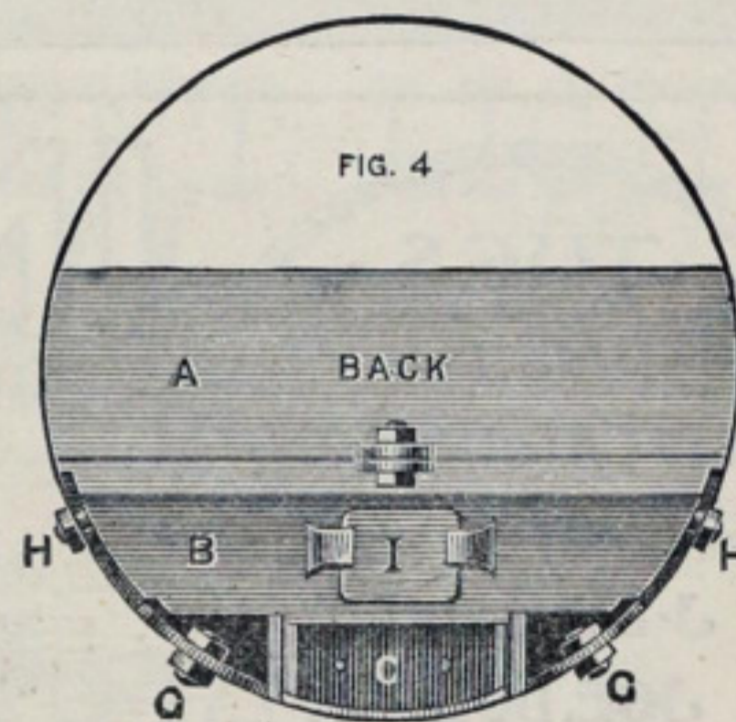
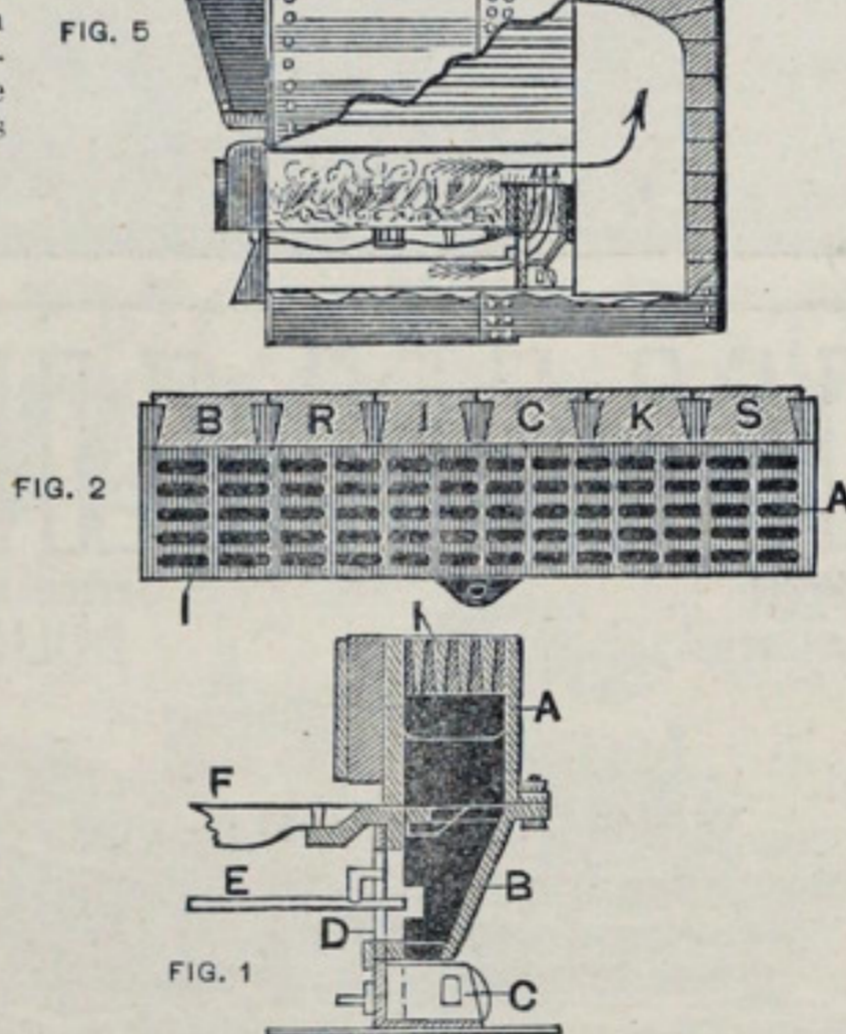
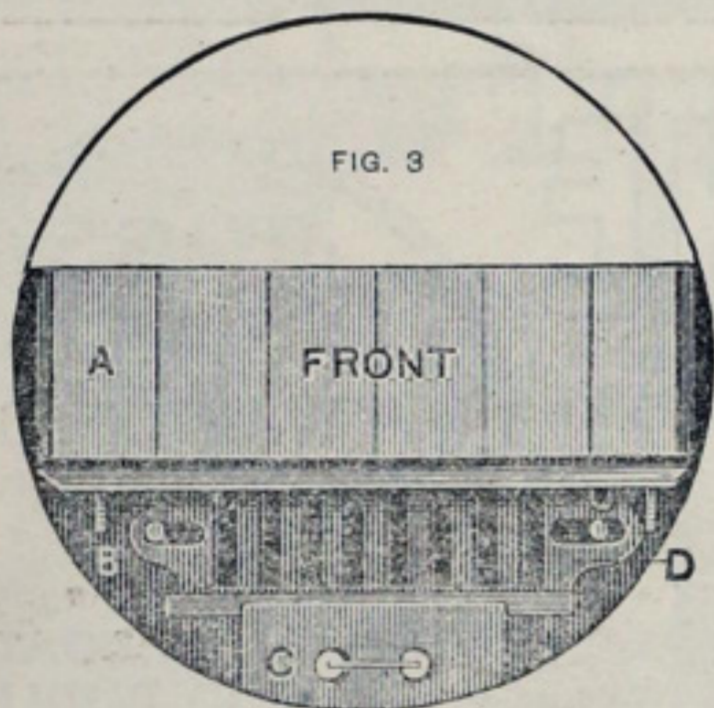
Several lake steamers have been fitted with forced draft where speed is desired, but in cargo carriers fuel economy is more valuable than speed. It is stated by the former owners of the steamer A. P. Wright, recently purchased by J. C. Gilchrist, that by means of a new patent bridge wall she saves 25 tons of coal per trip, and in addition to this saving the boilers steam

when it comes in contact with the newly produced gas, the latter is not only almost entirely lost by escaping unused through the stack, but it cools the gases already in the combustion chamber, and in this way checks the generation of steam.

The object sought and attained by the Tucker bridge wall is, to admit the necessary amount of air to produce combustion and to regulate it by a damper, which is worked from the outside, and to so heat the in its passage to the combustion chamber that it will at once combine or mingle with the gases already in the chamber without cooling them, and thereby produce more rapid and perfect combustion, which it not only does, but it also greatly lessens the smoke and the escape of soot and cinder from the stack as well as the deposit in the tubes, all of which proceed from the same cause viz., imperfect combustion, and are largely due to the defective character and construction of the old style of bridge wall. For the bridge wall itself, aside from the advantages resulting from its use, there is economy because it is more durable, and being sectional, the upper part, which is above the level of the grate bars and more liable to burn can be easily removed

Following are references to illustrations:— Figure 1 is a vertical section of the hollow Bridge Wall, showing the damper connections. Figure 2 is a plan of the top. Figure 3 is a front elevation of the bridge wall in the furnace. Figure 4 is the back elevation of the same. Figure 5 is the section of a boiler, showing the furnace all fitted and under fire, and the manner in which the air passes up through the slots or openings in the top of the bridge wall and meets the flame and gas as they are passing into the combustion chamber, thereby converting the gas into flame, increasing the evaporation and reducing the amount of fuel necessary to do the same amount of work. Letter a, figure 1, is the top, which can be removed from the bottom by taking out the bolt shown at the back. Letter b is the bottom of the bridge wall, which is held in position in the furnace by the studs g and h, figure 4, the wall slipping down over them. The studs h go into a slot and are to prevent the wall from being shoved over, while the studs

g go through the casting and have nuts on the inside which hold the wall firmly in position. All studs are tapped through the sheet with nut and washer inside. By removing the two inside nuts from studs g, the wall can be lifted out of the furnace independent of the water space. Letter c is the Tompkin plate, which shoves in and covers the opening in the bottom of the wall b. When any dirt is seen through the damper d, pull the Tompkin plate out and it all falls into the ash pan, so that the wall is always clear. Letter d is the sliding damper, operated from the front of the furnace by the rod e, so that the amount of air necessary can be regulated at any and all times. This damper rests on a bevel strip at the bottom, so that there is no possibility of sticking. Letter f is a section of grate bar resting on bearing bar which is cast on to the bottom of the bridge wall b. Letter i are the openings on the top a. Letter i, figure 4, is a hand-hole plate, but is never used when there is room for a Tompkin plate.



better, the perfect combustion doing away with the black smoke that usually comes from the stack. A saving of fuel of from 4 to 18 per cent. is maintained for the Tucker bridge wall by testimonials, the saving varying with the kind of coal used and other conditions, and besides there are additional advantages among which is the fact that boilers which are sluggish and hard to steam with the old style of bridge wall, are made to steam much easier with this.

The following facts are indisputable: Coal must be distilled or converted into gas before it can generate the full amount of heat it is capable of producing. Whenever a furnace door is opened and fresh coal thrown on a fire, a large amount of gas is immediately produced which is virtually lost, so far as its heating properties are concerned, unless the oxygen or air, which must be admitted to unite with the carbon and hydrogen in the fuel to produce combustion, is heated before it comes in contact with the newly generated gas and before it passes into the combustion chamber. Unless the oxygen or air is heated

and renewed. It also requires much less expense to keep it in order.

This bridge wall is in use in over seventy steamers and several stationary plants on the Pacific coast and on six steamers running into New York, besides being in use on two lake steamers. John D. Spreckels & Bros., who have them in use on the eight steamers and tugs of the Oceanic Steamship Company, say: "We are using Tucker's bridge wall on all our steamers and find they effect a saving in coal and to be beneficial to the boilers. Our tug boats now raise without difficulty all the steam required without the use of a steam jet in the smoke stack." Superintending Engineer Cosgrove of the Pacific Coast Steamship Company says that company is using the Tucker bridge wall on ten steamers and in addition to saving coal he claims that they do away with dirt and soot that formerly accumulated on deck. The Risdon Iron and Locomotive Works, San Francisco uses them for stationary boilers and recommends them. The patentee is Mr. E. W. Tucker, and patents were granted May 17 and July 26, 1887, the same having been sustained by United States courts.

H. G. Trout & Co., 224 Ohio street, Buffalo, N. Y., are lake agents for this bridge wall.

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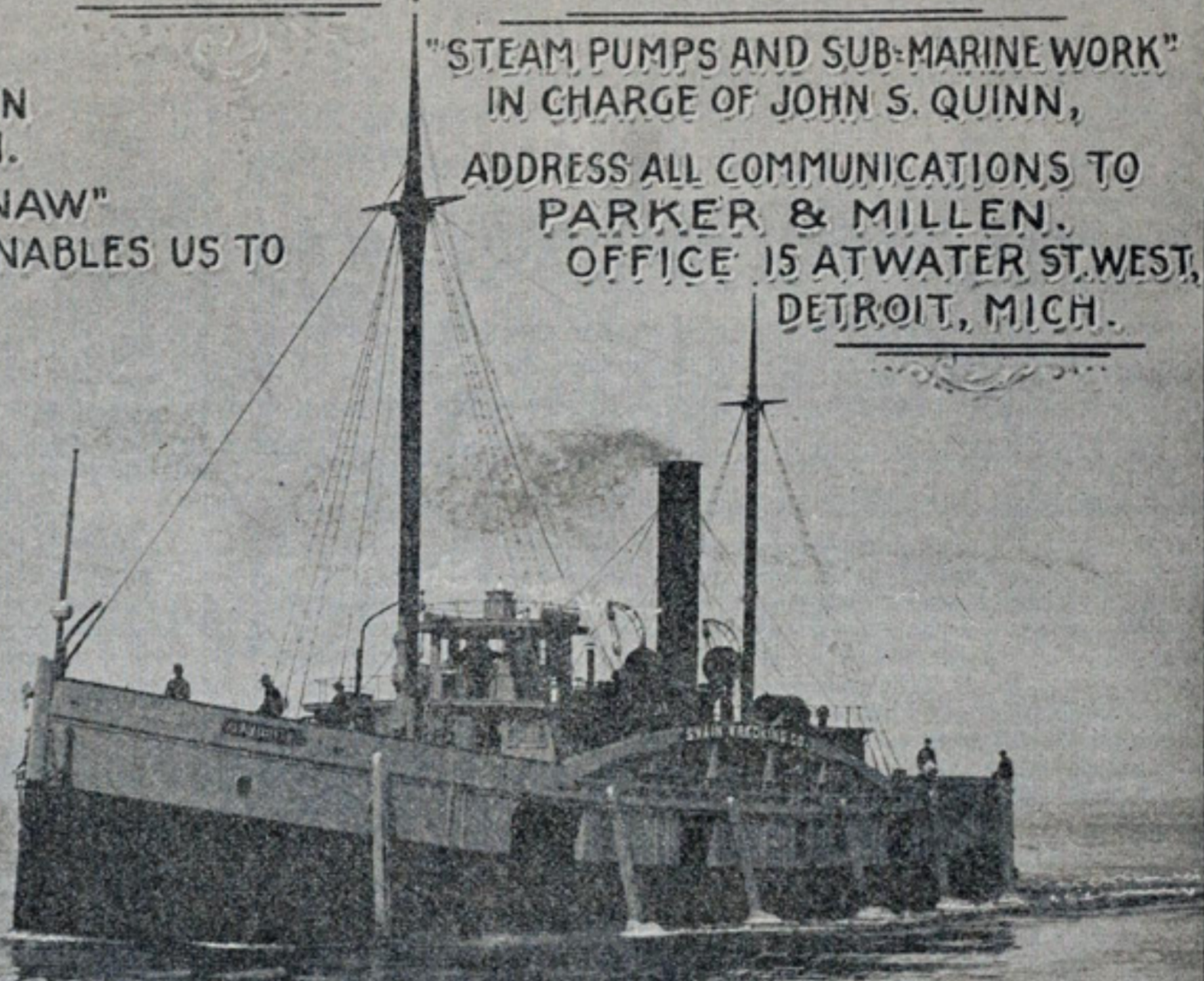
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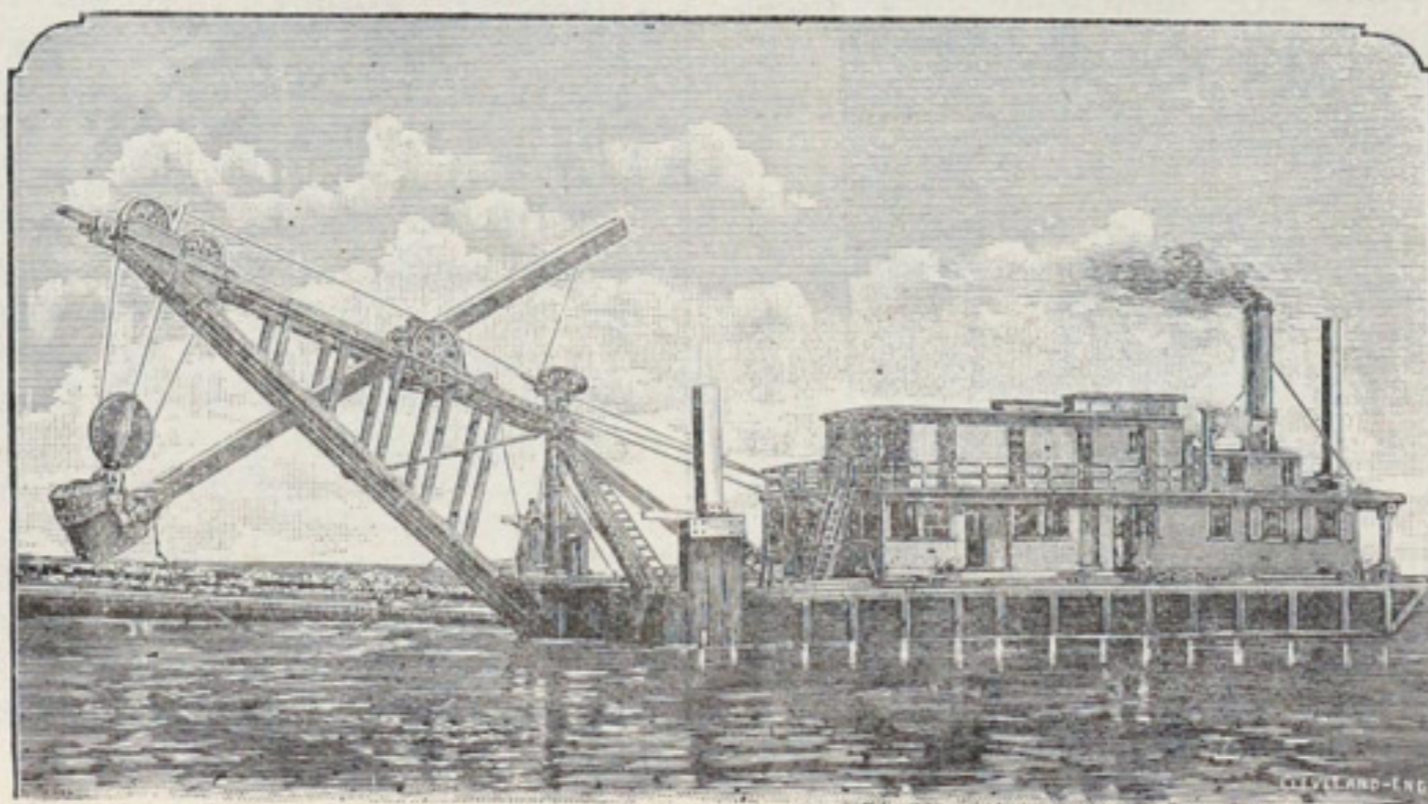
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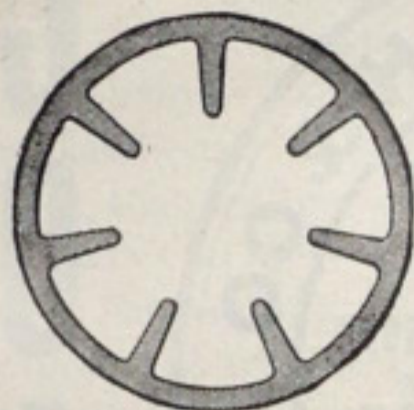
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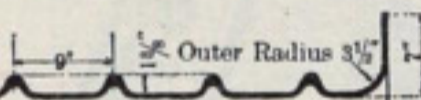
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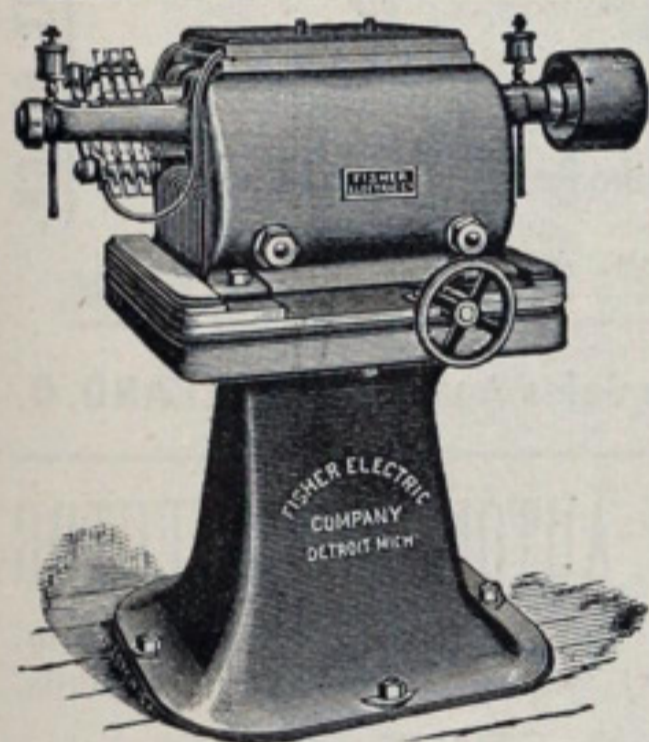
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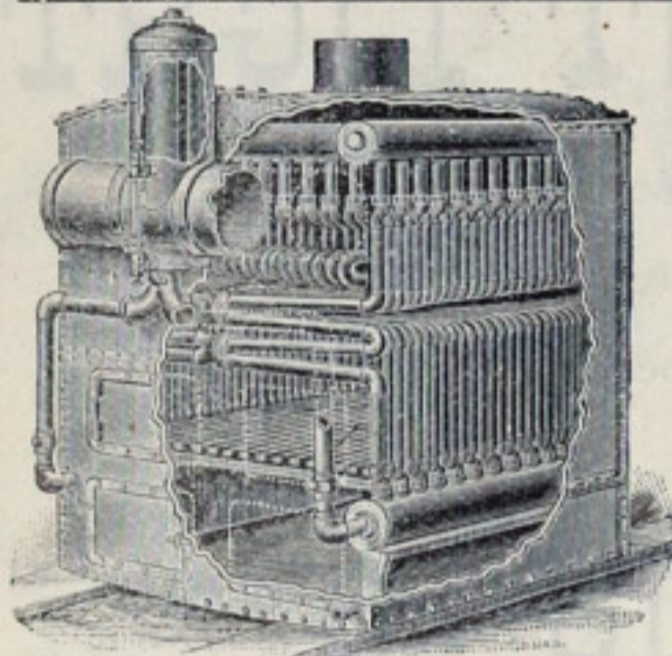
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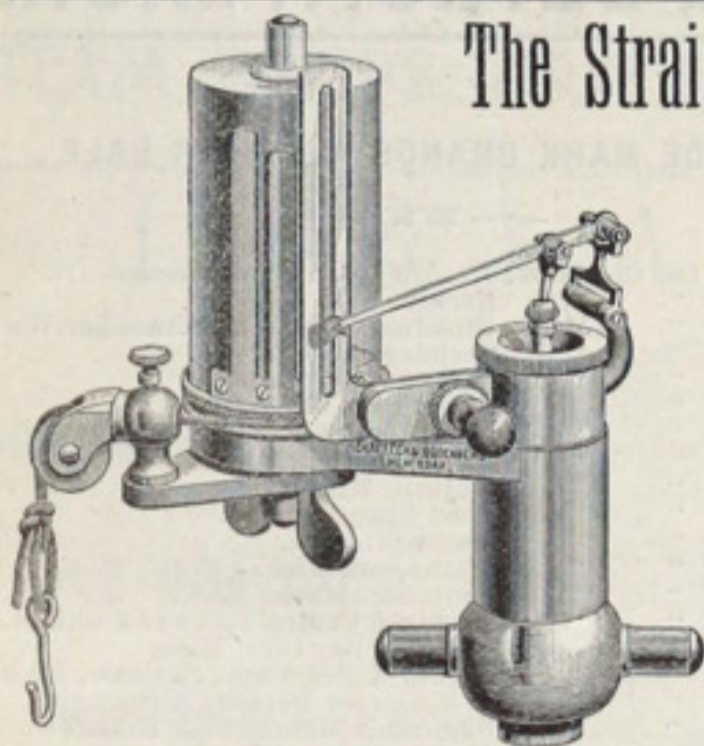
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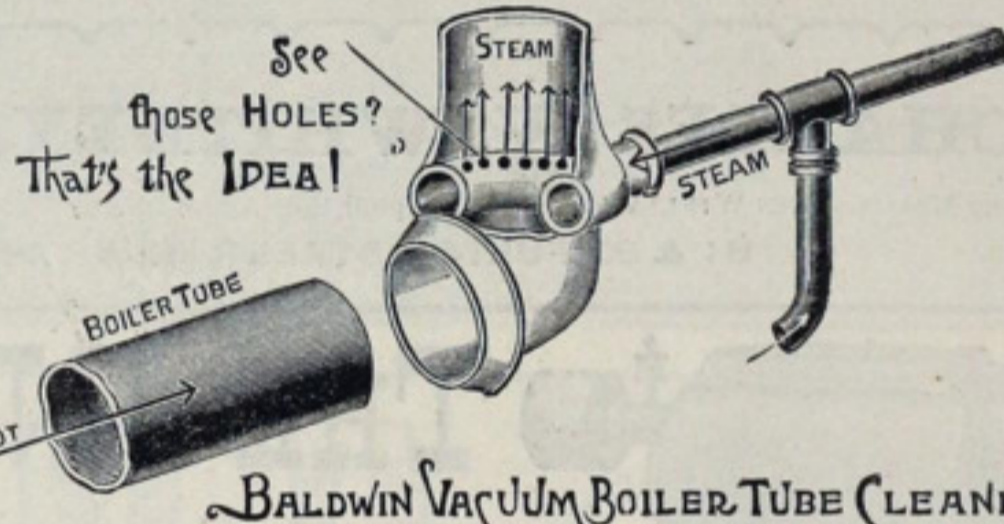
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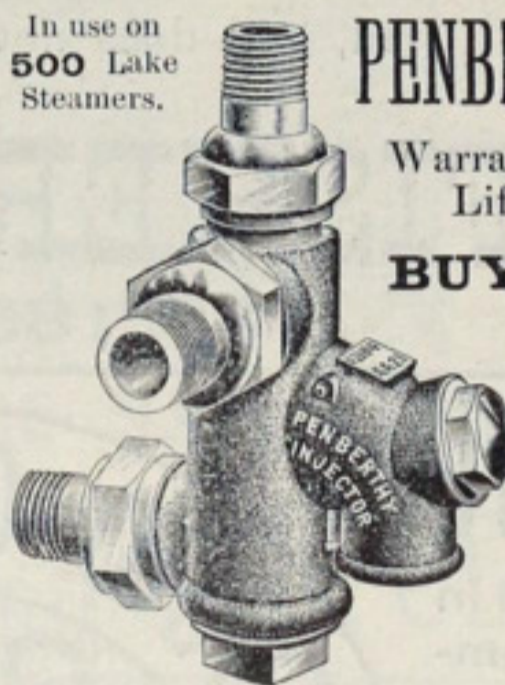
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For LOAM, DRY SAND AND SKIN DRIED CASTINGS. HAS NO EQUAL IN THE WORLD.

PERMIT US TO DEMONSTRATE THIS.

**CLEVELAND FACING MILLS, CLEVELAND, O.**